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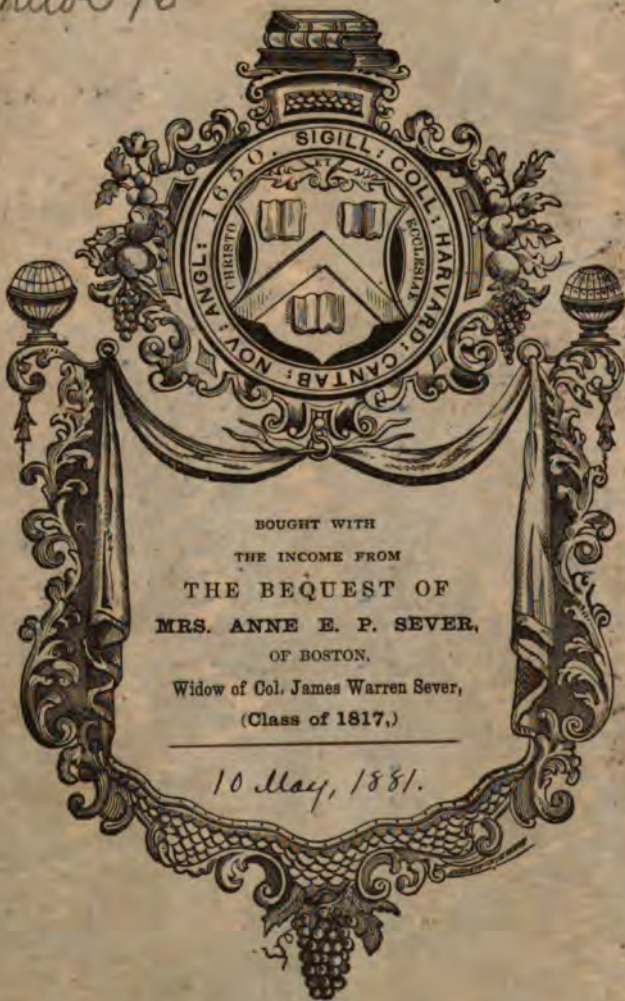
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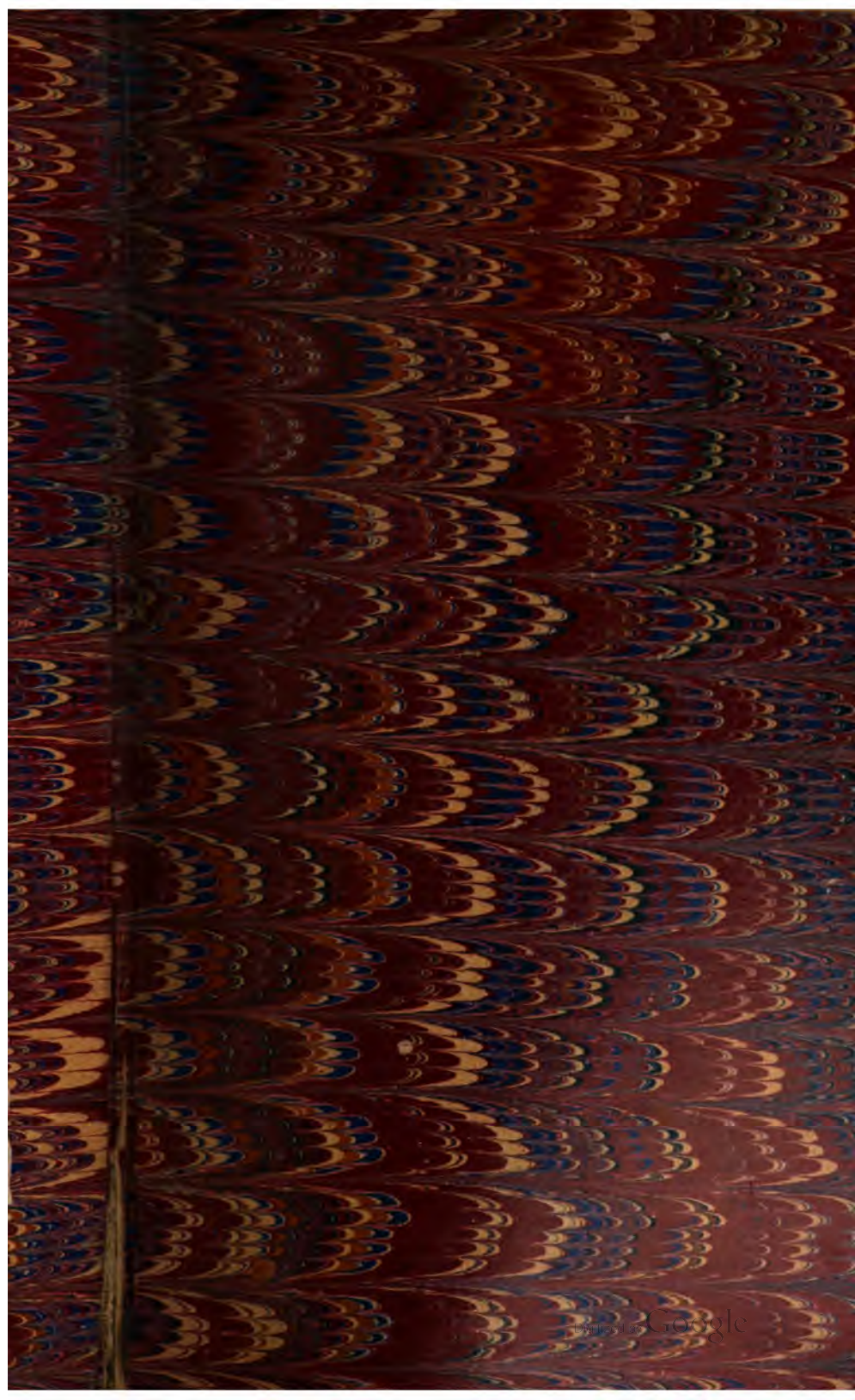
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HERMATHENA:

A SERIES OF PAPERS ON

LITERATURE, SCIENCE, AND PHILOSOPHY.

IV.

HERMATHENA,

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LITERATURE, SCIENCE, AND PHILOSOPHY,

BY

Members of Trinity College, Dublin.

1
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HERMATHENA.

VINDICIAE LATINAE.

THE following obvious correction of a passage in the Prologue of the *Andria* I cannot find to have been anywhere suggested. The passage runs thus :—

Menander fecit Andriam et Perinthiam :
Qui utramuis recte nouit ambas nouerit :
Non ita sunt dissimili argumento, sed tamen
Dissimili oratione sunt factae ac stilo.

Thus, after the strong statement that he who knows either the *Andria* or the *Perinthia* may be said to know both, the poet goes on to say that ‘they are *not very dissimilar* in plot, *but yet* are unlike each other in style.’

For *Non ita* read *Ita non*, and, the punctuation having been corrected, we have a thoroughly satisfactory sense :—

Menander fecit Andriam et Perinthiam :
Qui utramuis recte nouit ambas nouerit,
Ita non sunt dissimili argumento : sed tamen
Dissimili oratione sunt factae ac stilo.

‘He who knows either knows both, so similar are the plots : yet the style is different in each.’

PHORM. 342.

PH. cena dubia apponitur.

GÆ. Quid istuc uerbi est? PH. Vbi tu dubites quid sumas potissimum.

It is a mistake to explain from this passage the *cena dubia* in Horace (Sat. ii. 2. 76). There *cena dubia* means 'a dinner of doubtful quality,' and *dubia* is used as by Pliny (H. N. xviii. 74), when he applies it to *vina*. Here, too, *dubia* is a depreciatory epithet, and hence the joke in the passage; Phormio used a depreciatory epithet of *cena* when the context leads Geta to expect some word like *lauta*; hence Geta asks, *Quid istuc uerbi est?* and Phormio, quite in accordance with the *genre* of Latin humour, replies by an explanation of *dubia* framed to suit the exigency of the moment, and deriving its humour from the fact that it *reverses* the real meaning of the word.¹

PLAUTUS, MILES GLORIOSUS, v. 100.

Is amabat meretricem † matre † Athenis Atticis.

To defend *matre* is of course out of the question; *patrem non dicit quod is incertus ut meretricis* is the only attempt of the older commentators represented by J. F. Gronovius;

¹ The clever eulogy on Menander preserved by Aristophanes the Grammarian has not been properly emended. It runs:

ὁ Μένανδρος καὶ Βία,
πότερος ἄρ' ὑμῶν πότερον ἐμμήσατο.

The expedient of reading *ἀπεμμήσατο* for *ἐμμήσατο* of course sets the metre

right, and has been generally adopted; but *ἄρ'* has all the appearance of another older attempt to cobble up a gaping verse. I fancy that the criticism was originally conveyed in a dependent sentence, and that the verses ran thus:—

ὁ Μένανδρος καὶ Βία,
πότερος ὑμῶν πότερον ἐμμήσατο
[οὐκ οἶδα].

and among moderns no one has essayed the task but Aug. Lorenz, who reads

Is amabat meretricem *patre et matre Atticis*.

But, apart from other considerations, Philocomasium could not have been *patre et matre Atticis*, for she would then have been *ingenua et libera*, which the whole play shows her not to have been, though the writer of the 2nd Argument has fallen into the error of so describing her, misled no doubt by v. 490, where, however, not Phil., but her pretended twin sister, is described as *ingenua et libera*.

The defence, then, of *matre* must be abandoned; but the emendations of the word have not been emendations at all, but mere guesses, which in no way account for the existence in the MSS. of the corrupt *matre*; Ritschl, for instance, reads *altam* for *matre*, Cam. *aeque*, Brix *itidem*, and so forth. I suggest *acre* for *matre*. I shall first show (A) that *acre* and *matre* are palaeographically (one may say) *the same*; and then (B) I shall defend *acre* = *acriter* = 'intensely,' on grounds of Plautine usage.

(A). *Acre* was corrupted into *matre* (1) by the dittography of the final *m* of the preceding word, *meretricem*; (2) by the confusion between *c* and *t*.

For (1), dittography, it will be enough to mention *uim mec ogis* for *ui me cogis*, 454; *nostris spolia* for *nostris spolia*, 599; *eis statuit* for *ei statuit*, 728; *culpante et* for *culpant et*, 761; *sit tibi* for *si tibi*, 838; *uenite ephesum* for *uenit Eph.*, 975; *autem milia* for *autem illa*, 1003; *det tunicam* for *de tunica*, 1423; *Carios servos* for *Cario servos*, 1427.

Of (2), *t* wrongly written for *c*, we have the following cases in this play:—*attem*, 4; *obitiemus*, 148; *uitino*, 154; *fatiam*, 157 (and *passim*); *crutibus*, 184; *audatiam*, 190; *fallatiam*, 195; *excrutiatum*, 567; *plateat*, 614; *merti*, 727;

portinam, 758; *mendatium*, 967; *obsetrare*, 971; *sotium*, 1013; *prouintia*, 1159; *spetiem*, 1235; *ferotior*, 1325.

Both these errors, dittography and *t* wrongly written for *c*, occur together in *Periplectomenes* for *Periplecomenus* (*passim*), and *custodit cauto* for *custodi cauto*, 467; and we have an *exactly parallel* corruption in *omnem matiem* for *omnem aciem*, 1029.

(B). In defence of *amabat acre* = 'he was violently enamoured of,' it is to be remarked (1) that we find the phrase *amare acriter* in Pseud. I. 3. 39; (2), *acre* for *acriter* is found in Sall. Frag., and (perhaps) in Pers. iv. 34, and this is a common usage in Plautus: for instance, we have *prouenisti futile*, Stich. ii. 2. 73, and *fidele fidelis* in Capt. ii. 3. 78. In this last passage we have the express testimony of Nonius, '*fidele pro fideliter* Plautus Captivis.' Now, I am far from holding that we should always accept as certainly Plautine every Nonian quotation from Plautus. I even believe that he often quoted verses from Plautus from memory, and erroneously; but I am confident that he never ascribes to Plautus a peculiar grammatical usage on the ground of a certain passage, without making sure that he quotes at least the significant part of that passage correctly. I believe, therefore, that in Capt. ii. 3. 78, the right reading is *Fac fidele sis fidelis*; and *fidele* (= *fideliter*) *fidelis* is of course thoroughly Plautine; cp. *firme firmus*, *misere miser*, *impudenter impudens*, *sapienter sapere*, &c. Again, *celere* is certainly an adverb in Cur. i. 3. 4, and probably in Ter. Ph. 179, though in the former passage edd. have made *celere* an adjective by reading *properum* for *propere*, or *subitum* for *subito*. Quite similar, too, is the use of *insanum* for *insane*, as in Mil. 24; *insanum magnum*, Bacch. iv. 5. 1; *insanum bona*, Most. iii. 3. 5, and *insanum ualde uterque deamat*, Nervol. Fr. 7. Nonius also quotes *immane* for *immaniter*.

MILES, 229-231.

PE. Tu unus si recipere hoc ad te dicis, confidentiast

Nos inimicos profligare posse. PA. Dico et recipio

Ad me. PE. Et ego impetrare dico id quod petis. PA. At te Iuppiter Bene amet.

Such is the form in which these verses should appear. Yet edd., from the revival of learning down to Brix, have omitted *Ad me* in 231, and to make up the verse have inserted a *te*, quite unnecessary for the sense, before *impetrare*. The passage, as I have given, is exactly as it stands in the MSS., except that they give *egom* and *dicom* for *ego* and *dico*, a very common error, especially when *m* is followed by *in*, *im*, or even *id*; *in* is almost identical in form with *m* in a cursive MS.; hence we find, in 648, *subgilom* for *subigito in*; so also *in alam* for *malam*, Cic. Att. i. 19. 2; *in hercule* for *mehercule*, ib. 12. 3; *esses sin* for *esses me*, ib. 10. 6.

The *ad me* in the answer of Pal. is almost essential in reply to the remark of Per.:

Tu unus si recipere hoc *ad te* dicis.

MILES, 236.

Neque habet plus sapientiae quam lapis. PE. Ego istuc scio.

The usual remedy for the halting metre in this verse is to read *sapientiāi* for *sapientiae*; but even after this change the verse is very unrhymical. I would suggest to read

Néque habet plus sapiéntiae quam lápis. PE. Ego mi istúc scio.

Ba has *egom . . stuc scio*, Bc *egom. istuc scio*, and CD *aego mist uescio*. For the phrase *ego mi istuc scio*, cp. *tute scias soli tibi*, 282; *mihi ego uideo mihi ego sapio*, 331; and *mi*

equidem esurio non tibi, Capt. iv. 2, 86. For *egō*, see Amph. i. 1. 44; so *mōdo* sometimes has the last syllable long in Pl., and *immo* always. There are many places in Pl. where *ego* really has the last long (e.g. Capt. v. 4. 24; Cist. iv. 2. 80; Pseud. i. 3. 37; Epid. iii. 4. 17), but where Müller and others wrongly remodel the verse.

MILES, 586-588.

PE. Illic hinc abscessit: sat edepol certo scio

Occisam saepe sapere plus multo suem

* * * * *

Qui adeo admutilatur ne id quod uidit uiderit.

A reference to any critical edition of the *Miles* will show how various and how futile have been the attempts of editors to impart sense to this passage. Lorenz was the first to perceive that a verse must have dropped out. But, even though we postulate a *lacuna*, and thus supply the sentiment which Lorenz and Brix demand, we are still far from a satisfactory meaning for the passage. For, let us suppose (with Brix and Lorenz) the lost verse to have contained words answering to 'than this fool Sceledrus,' then the sense of the whole passage would be: 'I am quite sure that a slaughtered sow has often more sense than this blockhead, who is cajoled into not seeing what he saw.'

But (1) *occisa sus* is not among the many types of stupidity in Pl.; and (2) what is to be made of *saepe*? If it is to be taken into account, we should rather expect the perfect than the present *sapere*.

Can there be in the passage any allusion to the custom referred to in Men. ii. 2. 16, and testified to by Varro (R. R. iv. 16), of offering *pigs*, so as to obtain the

restoration of a sound mind? The passage (with a slight modification of 587) would then have run somewhat thus:—

Sat edepol certo scio
Occisa saepe sapere plus multo sue
Insanos; sed illine opus est plena hara suom
Qui adeo admutilatur ne id quod uidit uiderit?

‘I know that madmen often become much more sensible through the slaughter of a sow; *but would not this fellow require a whole sty to be sacrificed for him*, since he is cajoled into not having seen what he actually saw.’ Of course *illine* = *nonne illi*; Pl. does not use *nonne*. I need not add that the italicised words are intended merely to represent the kind of sentiment that might have been conveyed by the lost verse.

MILES, 604–606.

Quippe si rescuere inimici consilium tuom,
Tuopte tibi consilio occludunt linguam et constringunt manus,
Atque eadem quae illis uoluisti facere faciunt tibi.

It will be at once seen that half a foot is wanted in the first and third of these verses. In the first, Müller inserts *hercle* after *si*; Bentley, *enim*. I suggest

Quippe *qui* si rescuere inimici consilium tuom.

Qui is often attached (like Greek *πως*) to particles of assertion by Pl. and Ter., as in *quippe qui Vbi quid subripias nihil est*, Aul. ii. 5. 22; *quippe qui Magnarum id saepe remedium aegitudinumst*, Ter. Heaut. 538. In Plautus, *qui* indef. is found not only with *quippe* but with *ut*, *pol*, *ecastor*, *edepol*, *hercle*, oftenest with *hercle* (Fleck. Krit. Misc. p. 28; Lorenz, Most. 811; Brix, Capt. 550).

Again, in the third verse of the above passage half a foot is plainly required between *facere* and *faciunt*. Brix inserts

tum; Ritschl, after Guyet, *illi*. But why did *tum* or *illi* fall out? I propose *re*, which fell out after the last syllable of *facere*. This is an excellent example of the converse principle to *dittography*, which I may perhaps call *lipography*. There is an antithesis between *uoluisti* and *re*, 'intention' and 'actual experience,' 'the very things which you *meant* to do to them they *actually* do to you.' Cp. *non re sed opinione*, Cic. N. D. iii. 53. The antithesis between *re* and *uerbis* is also very common in Pl., and *res* often means 'actual experience,' 'reality,' as in *rem potiore uideo*, Aul. iv. 7. 12; *haec res agetur nobis uobis fabula*, Capt. prol. 52; so *aut consolando aut consilio aut re iuero*, Ter. Heaut. i. 1. 34; *res, aetas, usus*, Ad. v. 4. 2.

MILES, 691-693.

Da qui farcit, da qui condit, da quod dem quinquatribus
 Praecantatrici, coniectrici, ariolae atque aruspicae;
 Flagitiumst si nil mittetur quo supercilio spicit.

Ritschl has not deserved well of this passage, yet he has been followed by all modern editors. He has transposed v. 693 to after 697 without any gain whatever, and he reads in v. 691 *da qui faciam condimenta*. The reading of the MSS. is *da qui faciat condiat da*. A. Palmer has shown (Herm. v. p. 263) that in Most. i. 2. 37, *faciunt* is certainly a corruption of *farciunt*, a fact which here confirms *farcit*, the excellent correction of Bothe. For *da (illi) qui farcit*, cp. *meri bellatores gignuntur (ex illis) quas hic praeg-nates facit*, 1077; and (a still closer parallel) *cupio dare mercedem (sc. illi) qui illunc ubi sit commonstret mihi*, Cur. iv. 4. 34. Whatever may be said for *fartum*, in v. 8, no objection can be taken to *farcit* here; for if it be denied that *qui farcit* is the 'sausage maker,' or 'dealer in the *moretum, alliatum*,' it cannot be denied that *qui farcit* may

mean the dealer in fat poultry, as in *gallinas et anseres sic farcito*, Cato, R.R. 89; see Varr. R.R. 3. 9; Col. viii. 7. 4.

In his treatment of verse 693, I cannot help thinking that Ritschl (followed as he is by all modern edd.) is perverse and unscientific. Throughout he of course recognizes the paramount authority of BCD, especially when confirmed by A, and rightly looks on F (*Codex Lipsiensis*) as not possessing at all the value of a *codex* in the true sense of the word, and being no better than a rather unscientific edition.¹ Yet here he takes the reading of F in *quo supercilio spicit*, though BCD, with A, give *quae* for *quo*, and though *quae* is also preserved by Festus. '*Quae non quo mirum est etiam Festum testari*,' says Ritschl, but is not thereby moved to doubt the soundness of *quo*. Yet *quo supercilio spicit* gives a very forced sense; indeed, it may well be doubted whether the words could convey the supposed meaning, 'how cross she looks' (when she does not receive her present). Ritschl, however (followed by all modern edd.), does not even consider the possibility of defending *quae*.

I believe there is an ellipse of *ei* before *quae* (as A. Palmer suggested to me), just as twice in v. 691, in 1077 and in Cur. iv. 4. 34, and that the passage may be explained retaining *quae* in either of two ways; either (1) *quae supercilio spicit* describes some woman who practised some obscure mode of divination from eyebrows, or (2) we should read

Flagitiumst si nil mittetur QUAE SUPERCILIA AUSPICAT:

'It is a sin not to send a present to the dame who augurs from (the twitchings, &c., of) eyebrows.' *Auspico* is used in this sense with accus. in Stich. iii. 2. 46, where *auspicare*

¹ See Teuffel, i. p. 123: 'In the course of the 15th century in Italy, probably by order of Alfonso I. of Naples (after 1435), and perhaps by Antonius of Palermo, a text of these 20 plays was made in conformity with

the requirements and taste of the time in a very arbitrary and ignorant manner, with innumerable changes, conjectures, and interpolations.' Such a text was the *Codex Lipsiensis*, commonly called F.

mustellam means 'to draw an omen from a weasel;' and we learn from Pseud. i. 1. 105, *quia futurumst ita supercilium salit*, that the twitching of the eyebrow was regarded as a sign that a hope would be fulfilled. The same superstition is referred to in a well-known passage in Theocr. iii. 37 :

ἀλλεται ὀφθαλμός μεν ὁ δεξιός· ἀρά γ' ἰδησῶ;

MILES, 777-779.

- PA. Atque is Alexandri praestare praedicat formae suam,
 Itaque omnis se ultro sectari in Epheso memorat mulieres.
 PE. Edepol qui te de isto multi cupiunt *nunc* mentirier.

Nunc, in v. 779, is the conjecture of Acidalius, which has been accepted by all subsequent commentators down to the present day. Wrongly, as I think. *Non* is the reading of all the MSS., including even F and Z. It has been hastily assumed that *non* is an obvious slip, because at first sight it seems inconsistent with the required sense. Yet a careful consideration will show that it is *nunc* which is inconsistent with the whole tone of the play, while *non* is a thoroughly Plautine touch, and gives a sentiment entirely suited to the character of the speaker. Palaestrio says that the *Miles* boasts 'that all the women in Ephesus uninvited run after him.' Now if Periplecomenus replies, "Aye, faith there's many a man in Ephesus would fain thou wert now lying," he pays a tribute to the attractions of the *Miles*, and represents him as really a lady-killer and successful rival of husbands. Yet the *Miles* is throughout depicted as a Malvolio without any of Malvolio's refinement, one who fancies himself irresistible, while he is really intolerable to women of every class for his vanity, his stupidity, and his perfumed curls. This is plainly put in 1391, 2 :

Qui omnis se amare credit quemque aspexerit,
 Quem omnes oderunt qua uiri qua mulieres.

Again, in 923, Acroteleutium says

Populi odium quidni nouerim magnidicum cinnannatum.

And lastly, observe the closely parallel passage, 91-94, which, though probably not by Plautus, yet shows what view was taken of the character of the *Miles* by the actors of the play:—

Ait sese ultro omnis mulieres sectarier :

Is deridiculost quaque incedit omnibus :

Itaque hic meretricis labiis dum ductant eum

Videas maiorem partem ualgis sauiis.

Nunc, therefore, is actually wrong. But what meaning would *non* give to the sentence? A meaning, as I have said, thoroughly consistent with the character of Periplecomenus, on painting which Plautus has spent already much pains; and he might therefore fairly expect the idiosyncrasies of Per. to be now familiar to the audience. Per. has been carefully described (670-720) as an opponent of matrimony and an upholder of the superior blessedness of a celibate life. Now, on hearing that the *Miles* boasts that all the women go after him unasked, he observes, 'I' faith, there's many a man in Ephesus would fain your words were true'; that is, there is many a husband would be glad enough to find himself rid of his wife by reason of the attractions of the *Miles*—glad enough to see his wife running after the *Miles* or anyone else, provided only she left him. Of course Per. uses *sectarier* in a slightly different sense from that which it bears in the mouth of Palaestrio. But that heightens rather than lowers the probability of this view.

MILES, 883.

Postquam adbibere aures meae tuae *morium* orationis.

This is my suggestion (already put forward, Herm. iii. 113) for *moram* of the MSS. Ritschl's *loream*, which has

been generally accepted, is utterly unsuited to Acroteleutium, who is the speaker of the line. 'The small thin wine of your discourse' is not only an unnatural expression in her mouth, but it is unsuitable to the rest of her words; and the reading of *loream* for *moram* does not commend itself on palaeographical grounds; *adbibere auribus* is such a very common figure that it almost ceases to be a figure at all. *Morium* is the latinised form of μόριον, 'a particle.' Pl. often gives a Greek word a Latin inflexion, as in *dulice*, *euscheme*, *comoedice*, *compsissume* in this play.

MILES, 1136.

Vna exeuntis uideo hinc e proxumo.

After *uideo* R inserts *iam*, Bothe *ego*, to avoid the *hiatus*: others remodel the verse in other ways. I would read

Vna exeuntis uideo *eos* hinc e proxumo.

Eos fell out after *-eo*—a case of *lipography*. *Eos* often suffers elision and synizesis together, *e.g.* in 240:

Tam similem quam lacte lactist: apud te eos hic devortier.

TRIN. 345.

Pol pudere quam pigere praestat totidem litteris.

This is usually explained 'though these words have the same number of letters'; *totidem litteris* would then be a very strange instance of the abl. of attendant circumstances; and the idea, it must be allowed, would be very far-fetched. Translate, 'I' faith, to be ashamed is better than to be sorry every letter of (lit., by as many letters as the word has).'

This is the *Ablativus mensurae*, as it is called by Draeger

(Historische Syntax, ii. p. 562); cf. *multis partibus maior*, Cic. N. D. ii. 36. For the *phrase*, cf. Cic. Att. i. 14. 3, *meis orationibus omnibus litteris in Pompeiana laude perstrictus*.

* CIC. EPP. AD ATT. I. 16. 13.

Sed heus tu! videsne consulatum illum nostrum quem Curio antea ἀποθέσιν vocabat, si hic factus erit, † fabam mimum † futurum?

On Plaut. Aul. v. 1, 10,

Repperi. Quid repperisti? Non quod pueri clamitant
In faba se reperisse;

Gronovius has this note:—

“Servus significans non parvam rem neque levem se repperisse, negat inventum sibi nihil maius quam quod pueri clamitant se reperisse in faba, nempe vermiculum quem *midam* vocant: eum enim pueri in fabis quaerere solebant, quique inveniebat inde exultare ac velut triumphum agere.”

Might not *fabae midam* be the right reading here for the corrupt † *fabam mimum* †? The extreme obscurity of the phrase would account for the corruption, and the sense would be very apt: ‘The consulate will no longer be the object of rational ambition; as well henceforth might a man triumph among the boys at finding the insect in the bean, as direct his ambition towards the consulate.’

CIC. EPP. AD Q. F. I. 2. 4.

De Blaudeno Zeuxide.

I suggested in a recent ed. of the Letters of Cicero (vol. i. p. 196) that we should read *Blandeno* for *Blaudeno* here, because it seemed to me that in a later passage of the

same letter an expression now unintelligible might be explained by a characteristic play on the word *blandus*. Mr. W. Warde Fowler in an encouraging and, in many respects, flattering notice of the ed. in *The Academy*, July 26, 1879, has somewhat misconceived the point of my note when he says that I have 'conjured up the name of a town that never existed.' There is a town *Blaudus* in Phrygia, but that town is not referred to here. The town referred to here is *Blaundus*, a far more celebrated town, also in Phrygia, probably the modern *Suleimanli*. *Blau-deno* is the conjecture of Manutius; *blainde* is the reading of M; *planindeno* is the reading of C. Zeuxis was undoubtedly a native, not of *Blaudus*, but of *Blaundus*; whether *Blaundus* may or may not be written *Blandus* as well as *Blaundus*, I leave to others to determine. The Roman writers are not remarkable for purism in adhering to native orthographies, and are not averse to assimilate to a Latin word a foreign word closely resembling it. However, I am quite willing to read *Blaundeno* instead of *Blandeno*. The pronunciation of *Blaundus* and *blandus* must have been well-nigh identical, and the play on *Blaundus* and *blandus* is really as good as the play on *Blandus* and *blandus*, and both are better than most of Cicero's puns. *Blaundus* is probably a Persian word meaning 'high'; but it could not be pronounced without suggesting to Cicero *blandus*, 'soft.'

TAC. HIST. I. 8.

Metu tamquam alias partes fovissent.

Is it not probable that Tacitus was led to use this somewhat confusing word *alias* through a reminiscence of Verg. Aen. v.

Non vires *alias* conversaque numina sentis?

TAC. HIST. I. 10.

Nimiae voluptates, cum vacaret; quotiens expedierat, magnae virtutes.

Here *expedire* is usually explained to 'take the field,' *zu Felde ziehen* (Heraeus), and the verb is supposed to be used intransitively or absolutely for *se expedire*. This alleged use of *expedire* is found only in Tac. and only in one other passage, H. i. 88, *multo . . . secum expedire iubet*; for in H. ii. 99, where *expedire* is usually read, *expediri* is actually the reading of M. Some years ago I suggested to read *se expedire* for *secum expedire* in H. i. 88, and in H. ii. 99 to retain *expediri* of M. I find that in his third ed. Halm has made these very obvious corrections of the text of his earlier edd. I cannot, however, agree with him in reading *se expedierat* in the passage now under consideration. *Se expedire*, 'to take the field,' is not a proper correlative to *vacare*, 'to be at leisure.' *Quotiens expedierat* here means 'whenever the occasion demanded it,' and *cum vacaret* is 'when he gave himself up' (to pleasure): cf. *vacare gaudio*, H. i. 44.

TAC. HIST. I. 13.

Spem adoptionis statim conceptam acrius in diem rapiebat.

'He was led to cherish more and more passionately every day those hopes,' &c.—C. & B.

'Jagte der Hoffnung nach.'—Heraeus.

But I think we certainly have here another echo of Vergil. In Aen. i. 176:

Suscepitque ignem foliis atque arida circum

Nutrimenta dedit, *rapuitque* in fomite flammam,

the word *rapuit* is generally explained as referring to a practice of waving the tinder to fan the flame; *rapuit*

virtually means 'fanned' in that passage; and so here, the metaphor being distinctly pointed to in the word *conceptam*: 'He fanned every day to a brighter flame the spark of hope.'

Concepta flamma, conceptus ignis are too familiar to require illustration.

TAC. HIST. I. 21.

Fingebat et metum quo magis concupisceret.

Mr. Nesbitt, in his very able Paper in last *Hermathena*, renders 'He conjured up fears to whet his desires.' The meaning is, not 'he kept before his mind (imaginary) fears,' but 'he worked himself into a (real) state of alarm.' I think this view of the passage is rendered certain when we remember that this strange usage of *fingere* has a Vergilian source in the fine passage,

Aude, hospes, contemnere opes, et te quoque dignum
Finge deo :

Verg. Aen. viii. 364.

TAC. HIST. I. 37.

Plus rapuit Icelus quam quod Polycliti . . . † perierunt.†

Mr. Nesbitt praises highly Ritter's conjecture of *petierunt* for the corrupt *perierunt* of M. But surely *præcierunt*, the reading of Halm's 3rd ed., is altogether superior. It is hard to see how so easy and common a word as *petierunt* could have been corrupted into *perierunt*.

TAC. HIST. I. 38.

Cum signum meum acceperit.

'Let it receive my signal.'—C. & B.

Heraeus has shown that *signum* means the σύνθημα or 'watchword,' 'parole,' which the Emperor gave to the

Tribune of the Prætorian cohort on guard. This act was an official assertion of the Emperor's accession; cp. An. i. 7, *defuncto Augusto signum prætorii cohortibus ut Imperator dederat*; and xiii. 2, *signum more militiæ petenti tribuno dedit 'optimæ matris.'*

TAC. HIST. I. 69.

Effusis lacrimis et meliora constantius postulando inopitatem salutemque civitati inpetravere.

'Bursting into tears, and with great earnestness demanding for them a better fate.'—N.

Meliora constantius postulando is a strange expression. Yet most of the edd. pass it over without comment. Heraeus seems to rightly explain the words as a reference to the exclamation *di meliora*, found in Verg. Georg. iii. 513. Hence we should render—'With tears and strangely earnest cries of *God forbid it.*'

The occasion justified their excitement, for it was *civitatis excidium* that the soldiers first demanded, and then deprecated. *Meliora postulando* = '*di meliora*' clamando. However, the words may have no deeper meaning than "urging their merciful petition more persistently than they had made their former cruel demand."

I should have mentioned that the suggestion of *fabæ midam* for † *fabam mimum* † is due to Mr. Brooks, formerly of Queen's College, Belfast, now of Trinity College, Dublin. I add the following passage in which the word distinctly occurs, though therein recognized as a rare word:—σηπόμενον δὲ ἕκαστον ἴδιον γεννᾷ ἐκ τῆς οἰκίας ὑγρότητος, οἷον οἱ μὲν πυροὶ καὶ αἱ κριθαὶ τοὺς κίας, ὁ δὲ κύαμος τὸν ὑπὸ τινων καλοῦμενον μίδαν.—Theophrastus, *de Causis Plantarum*, 4. 15. 4.

ROBERT YELVERTON TYRRELL.

VOL. IV.

C

HORAE TACITEAE.*

WE regret that when we revised our translation in 1871 we were not acquainted with Heraeus's edition. Of its excellence there can be no doubt. No student of Tacitus should neglect to consult it.

Such of Mr. Nesbitt's criticisms as relate to various readings and emendations of the text we do not propose to notice. A translator must select a text from which to translate. To make a practice of discussing emendations is to pass out of his province. We selected the text of Orelli, as that which at the time of beginning our task was in the highest repute. Our departures from it were very rare, and chiefly made at passages which in his scrupulous fidelity to the MSS. Orelli left in utter confusion. Heraeus' emendations are often very acute and probable. They indicate a reaction towards a freedom in conjecture which scholars of the last century allowed themselves, which was afterwards discredited, and which now seems likely again to prevail.

We frankly acknowledge that Mr. Nesbitt hits some blots in our translation, that some of his suggestions of a closer or more spirited version are good, and that some will commend themselves to the judgment of some readers, though others may entertain a preference for the meanings which they find in our translation. We shall not take notice of criticisms of which we acknowledge the justice, or which refer to what, we conceive, may fairly be considered open questions. We denote our translations by the letters 'C. & B.'—Mr. Nesbitt's by the letter 'N.'

* This article is a reply to the Paper bearing the same name, by Professor

Nesbitt, in the last Number of *Hermathena*.—ED.

(1) *Ita neutris cura posteritatis inter infensos vel obnoxios.*

‘So between the enmity of the one, and the servility of the other, neither had any regard to posterity.’—C. & B.

‘Thus, enemies or slaves (of power), they were alike regardless of after times.’—N.

The two renderings do not differ substantially. Ours preserves the Latin ‘inter,’ which may, we think, be very well done. We might translate, ‘between haters and flatterers,’ or simply, ‘between hatred and servility.’ We cannot see that our translation is ‘inaccurate,’ though it might have been better to have omitted ‘the one or the other,’ words which are at least superfluous.

N. says that we have been misled by the ordinary meaning of the word ‘inter’ into thinking that it implies ‘a contrast.’ In the passage above there is an obvious antithesis, but we never supposed that ‘inter’ always implied one. The idea is absurd, as at once appears by such a phrase as Mr. Nesbitt quotes, ‘inter iura legesque.’ This use of ‘inter’ is familiar to every scholar. N. refers to i. 34, ‘inter gaudentes et incuriosos,’ which, he says, we have mistranslated from our wrong notions about ‘inter.’ Our translation is, ‘between the delight of some and the indifference of others,’ for which he would substitute ‘in a delighted and thoughtless crowd.’ We ought not, it seems, to have assumed any antithesis. There is clearly not the sharp or decisive antithesis which there is in the former passage, but is it not too much to say that there is none? There was a lying rumour that Otho had been suddenly slain, and in the crowd there would be friends and adherents of Galba, to whom the rumour would be welcome, while, as usual in crowds, many would be utterly careless and indifferent. We take this to have been Tacitus’s meaning; and indeed it seems the natural signification of the words, and well suited to the context.

'Credula fama,' in this same passage, we have rendered 'the report was easily believed.' This of course is a very unusual sense of 'credulus'; or possibly, as has been suggested, Tacitus may have meant in a sort of fashion to personify 'fama.' N. would translate, 'the opinion was easy of belief'; but this is really giving the word the *passive* meaning, to which he objects, and which is quite unusual. 'Easy of belief' is not the same as 'easily believing.' If we are to personify 'fama,' or adhere to the legitimate signification of 'credulus,' we must render the passage thus: 'between joy and indifference, public opinion readily assented.' But we believe that Tacitus deliberately used the word in an unfamiliar way.

(2). Cum agerent verterent cuncta.

'Robbed and ruined in every direction.'—C. & B.

'Carried everywhere their destructive activity.'—N.

'Agere vertere' is of course suggested by the Greek ἀγειν καὶ φέρειν. It denotes wholesale, indiscriminate plunder: 'robbed and ruined right and left,' we might say colloquially, and it would very fairly reproduce the original. The translator ought to aim at something spirited and picturesque, and this N., we think, fails to do, though his rendering, we admit, is perfectly accurate. Each verb, 'agere,' 'vertere,' ought, we think, if possible, to be represented. Livy, it may be noted, was fond of the phrase 'agere ferre,' which is an exact rendering of the Greek. Tacitus liked to take a phrase and slightly vary it in his own way.

(3). Supremae clarorum virorum necessitates; ipsa necessitas fortiter tolerata, et laudatis antiquorum mortibus pares exitus.

We depart from our usual practice of not noticing emendations of the text to express our dissent from the suggestion of 'ipsae neces' for 'necessitates.' It has, to

our ears, a very awkward sound. 'Neces,' also, is too objective a word to be employed in this context. It would be like saying, in English, 'Massacres were endured with fortitude.'

(4). Imperii arcanum.

A friend suggests, as giving the true force of this expression, 'secret of the imperial system,' *i.e.* that it was essentially military, and not civil.

(b). Pars populi integra. (Opposed to 'plebs sordida et circo ac theatri sueta.')

'The respectable part of the people.'—C. & B.

'The sound part.'—N.

Lipsius paraphrases 'integra' by 'sincera et lascivia temporum non corrupta.' Tacitus, no doubt, means such of the citizens as were not poor or dissolute; those, in fact, whom we describe as 'respectable'—a rather vague word, perhaps, but on the whole sufficiently intelligible.

(6). Inauditi atque indefensi tamquam innocentes perierant.

'They had perished without hearing or defence, like innocent men.'—C. & B.

'Dying without hearing or defence, they were regarded as innocent.'—N.

We do not think that Tacitus meant to say that they were considered to be innocent by public opinion. He was probably too well acquainted with them to think so. The authorities put themselves in the wrong, by proceeding against actually guilty persons by the illegal methods which are commonly employed against the innocent.

(7). Sed a legatis bellum suadentibus, postquam impellere nequiverint, crimen ac dolum ultro compositum.

'That this was a treacherous accusation invented by

the commanders themselves, who had urged him to take up arms, when they found themselves unable to prevail.'—C. & B.

'But that his lieutenants, having tried to excite him to war, and failed in the attempt, had actually concocted an accusation and plot against himself.'—N.

'Themselves' seems to us as good an equivalent for *ultra* as 'actually.' There was no 'plot' against Capito. Aquinus and Valens took the law quite openly and boldly into their own hands, and put him to death as a traitor.

(b). *Servorum manus subitis avidae.*

'The slaves caught with greedy hands at immediate gain.'—C. & B.

'In their sudden change of fortune were grasping.'—N.

We do not think that *subitis* can be translated as N. proposes. We should expect *in subitis*, or *ut in subitis*. The dictionaries agree in quoting the passage as an instance of the dative after *subitus*, but give no other instance. It is a doubtful case; but the balance of probability seems to incline to our view.

9. *Et metu tamquam alias partes fovissent.*

'They feared, because they might seem to have supported an unsuccessful party.'—C. & B.

'To be apprehensive, as having warmly espoused another party.'—N.

Tamquam expresses the subjective view, and its meaning may vary from actual reality to illusion. It should therefore be translated according to the context. Here it expresses a fact, and our translation fails accordingly. In one of the passages which N. quotes, *tamquam familiae senatorum armarentur*, it means an illusion.

(10). *Insignes amicitias ambitiose coluerat.*

‘He had cultivated with many intrigues the friendship of the great.’—C. & B.

‘With a view to his advancement.’—N.

‘Ambitio’ and its derivatives are somewhat perplexing words to a translator, and they hover between a variety of more or less kindred meanings. Tacitus so often uses them in a rather sinister sense, that we incline to think that here he does so, more especially as he goes on to speak of Mucianus soon afterwards as a man ‘*attritis opibus, lubrico statu,*’ and as ‘*malis bonisque artibus mixtus.*’ So we think it probable that in ‘ambitiose’ he may have meant to hint at something rather underhand and discreditable. We know how fond he was of conveying a disagreeable insinuation in a single word, and no word was better suited to such a purpose than ‘ambitiosus.’ Possibly it may here mean ‘with vain and ostentatious parade,’ such as a man bent on pushing himself into great society might be likely to affect.

(b). *Ad venerationem cultumque eius.*

‘To acknowledge his authority and to bespeak his favour.’—C. & B.

‘To do him homage and to express devotion.’—N.

Colo seems to have the meaning of ‘to cultivate the favour of,’ ‘to court.’

(c). *Occulta fati . . . post fortunam credidimus.*

‘As for the hidden decrees of fate, we believed them only after his success.’—C. & B.

‘Our belief in a secret disposal of destiny we have gained since their elevation.’—N.

We still prefer the aorist to the perfect. At the time Tacitus wrote, the belief in the exalted destiny of the Flavian family had become a thing of the past.

(11). Domui retinere.

‘To keep under home control.’—C. & B.

‘To reserve to the (Imperial) house.’—N.

We translated from the reading *domi retinere*, and still prefer it.

(15). Non quia propinquos aut socios belli non habeam, sed neque ipse imperium ambitione accepi, et iudicii mei documentum sit non meae, tantum necessitudines quas tibi postposui, sed et tuae.

‘Not because I have no relatives or companions of my campaigns, but because it was not by any private favour that I myself received the imperial power. Let the principle of my choice be shown not only by my connexions which I have set aside for you, but by your own.’—C. & B.

‘But I did not myself accept the empire from ambition, and, in evidence of the motive of my choice, let me point to the connexions, not only mine but yours, to which I have preferred you.’—N.

We do not think that *ambitione accepi* can be construed by ‘accept the empire from ambition.’ *Accepi* is hardly the verb which we should expect. N.’s version also spoils the argument. This seems to be—‘I rose by merit, not by favour: so do you.’ There is no question of *motive* in the person elevated.

(b). Irrumpet adulatio blanditiae, pessimum veri adfectus venenum, sua cuique utilitas.

We acknowledge that it is quite in Tacitus’s manner to connect the ‘pessimum veri adfectus venenum’ with what follows rather than with what precedes. Still, there are difficulties, as *et* has to be inserted without warrant. We do not think that *veri adfectus* can mean as N. suggests—‘of true affection.’ It surely is ‘of an honest heart.’ And it seems more likely that an honest heart can be poisoned

by the pleasing arts indicated by *blanditiae* than by self-interest, a motive which it would naturally reject.

(18). *Observatum id antiquitus comitiis dirimendis.*

‘Though this had from ancient time been made a reason for dissolving an assembly.’—C. & B.

In thus rendering the passage we have given a very familiar sense to the word ‘observare,’—one, too, which is particularly well illustrated by the following passage in Suetonius, Augustus, 57 :—*Observatum* est ne, quoties introiret urbem, supplicium de quoquam sumeretur. It seems sufficiently clear that Tacitus here uses the word in precisely the same manner. Mr. Nesbitt renders the passage: ‘through the *observation* of this phenomenon’ (the thunder and lightning), adding that in ‘observatum’ there is a reference to the *technical* ‘observatio’ (of the augur). We must note that his reading does not seem to harmonise with the construction of the passage. Does he take it thus: ‘these observations have from old time been made with a view to dissolving an assembly’? But our great objection is to the meaning given to ‘observatum,’ which we have no hesitation in pronouncing to be exceedingly far-fetched, at least in this particular context. Even Tacitus would have hardly expressed himself so obscurely. The plain ordinary sense seems to fit the passage exactly.

(20). *Novum officii genus et ambitu et numero onerosum.*

‘A novel office, and burdensome by the number and intriguing practices of those with whom it had to deal.’—C. & B.

A commission of thirty knights had been appointed to recover moneys squandered by Nero on all sorts of people. Hardly one-fourth remained in their possession, the rest having been wasted in profligate excesses. As we have rendered the words, these worthless people baffled the com-

mission by their numbers and their tricky evasions, as might have been expected. This appears to us to be the probable meaning; but there is nothing in the words themselves to decide the matter. 'Numero' and 'ambitu' may refer to the commissioners, as Ritter after Ernesti takes them, and the meaning may be that this commission was a burden to the State in consequence of the number of the commissioners, and the intrigues used to get on the commission. N. thinks that the context plainly points to this view, and he would translate 'burdensome from its numbers and malpractices.' That it was burdensome to the people and not to the commissioners appears to him evident from the succeeding words, "yet great was the joy to think that the men whom Nero had enriched would be (were now) as poor as those whom he had robbed." It is not so evident to us. The commissioners may have had much trouble and failed in some cases from the shift evasions (ambitu) of clever rogues; still they may have been successful in many other cases, and at this there would be general rejoicing.

In the next clause we followed Ritter's reading 'auctionibus' instead of 'actionibus' (Lipsius suggested 'auctionibus'), as agreeing better with the preceding words 'sector et hasta.' It is in fact merely a repetition of these words, which may possibly, as Orelli notes, be an objection to it. Perhaps as 'actionibus' is the reading of the Medicean MS., it would be best to retain it.

(21). Fingebat et metum, quo magis concupisceret.

'He even pretended to fear to make himself keener in desire.'—C. & B.

'He conjured up fears to whet his desires.'—N.

Acting a part, Mr. Nesbitt observes, does not quicken the feelings. But is not conjuring up (imaginary) fears very much the same as pretending to fear? We took the

meaning of Tacitus to be that Otho pretended to be afraid for himself; that in fact he tried to deceive himself into fancying that he had far more cause for alarm than he really had, and that he did this with the view of indulging his ambition more freely and of justifying it to his own conscience. Ritter understands the passage thus. Orelli takes it in a different sense, and thinks that the meaning is that Otho pretended to be afraid among his intimate friends, so that he might the better justify his ambition *to them*. It seems to us hard to say what Tacitus really meant. We are not satisfied with our own reading, which is certainly obscure. So, too, we think, is N.'s. But the fault is in the original. We would suggest as an improvement: 'He even feigned fear that he might be still more ambitious.' This, we venture to think, is as intelligible to an English as Tacitus would have been to a Roman reader. The meaning must be thought out.

(23). *Neroniani comitatus*.

'The progresses of Nero.'—C. & B.

'Nero's escort.'—N.

We were of course aware that *comitatus* means 'escort.' But it would have been necessary to insert 'of having served with'; and we preferred our version as briefer and more picturesque.

(25). *Onomastum futuro sceleri praecepit, a quo Barbium Proculum . . . et Veturium perductos, postquam . . . callidos audacesque cognovit, pretio et promissis onerat.*

N. thinks that *perductos* must mean 'brought into Otho's presence,' not, as we render it, 'brought over to his views.' But surely if Otho turned over the management of the affair to Onomastus, he would not at once have interfered by having an interview with these two men. And could it have been that Onomastus introduced them to Otho before

he made himself acquainted with their character, and purchased their complicity by bribes, &c. ?

(26). *Inter temulentos.*

‘Half intoxicated.’—C. & B. Seems better than N.’s ‘drunken.’

Elusit.

‘Mocked.’—C. & B.

‘Lightly turned aside.’—N.

But this would imply that Laco knew the suggestions to be true. This he certainly did not.

(30). *Cum amicum imperatoris ageret.*

‘When he was but the Emperor’s friend.’—C. & B.

‘When he played the part of friend to the Emperor.’—N.

‘Played the part’ gives an impression which Tacitus does not mean to give—that Otho was acting a part. His friendship with Nero was in fact as sincere as such a friendship could be. Tacitus simply means that he was in the position of friend to the Emperor.

(b). *Habitum et incessu an illo muliebri ornatu mereretur imperium ?*

‘Shall he earn the Empire now by his manner or gait?’—C. & B.

‘Should he by his bearing and gait have earned a throne?’—N.

We are certainly wrong in our tense. But *mereretur* is past potential rather than past deliberative conjunctive, as N. suggests.

(31). Germanica vexilla.

'The German *veterans*.'—C. & B.

'The *detachments* from the army of Germany.'—N.

'Vexillum' is a vague word, as we have observed in our note on the Roman army, while N. says that it may denote any detachment, whether veterans or otherwise. 'Veterani' had in the Roman army of this period a strictly technical sense, as explained by Tacitus, *Annals*, i. 38. With us, of course, the word is used loosely, and denotes merely old, experienced soldiers. In that sense we here used it, and the context would seem to justify it. These troops, it appears from i. 6, had been taken from the German army by Nero, and sent on by him to the Caspian passes for service in the expedition which he was preparing against the Albani. They were consequently soldiers of some standing, and as such Galba was particularly attentive to them. It would, however, perhaps here be better to restrict the word 'veterans' to its Roman technical sense, though we can hardly suppose that an occasional deviation from this usage would be seriously misleading.

In this same chapter the word 'electi' occurs twice. 'Missus Celsus Marius *ad electos* Illyrici exercitus' and 'Illyrici exercitus *electi* Celsum ingestis (infestis) pilis proturbaverunt.' It must have the same meaning in both cases, and we ought, we think, to have rendered it 'detachments,' as we do in the latter case, while in the former we have rendered it 'picked troops.' The word occurs again, i. 61, where N. notes that we ought not to have rendered it 'picked troops,' but simply 'detachments.' The context alone, we presume, can determine the question. In this last passage we so rendered it because it is immediately followed by the 'aquila quintae legionis,' the pick of the legion, it may be supposed; and the tenor of the passage seemed to suggest that Valens had given him the flower of the army of Lower Germany. In ii. 100 we have 'cum

vexillariis trium Britannicarum legionum et *electis* auxiliis,' where we translate—'a chosen body of auxiliaries,' which we take to be its undoubted meaning from the context. The word, in fact, is as vague as 'vexillum,' and denotes sometimes simply 'detachments'—sometimes 'picked troops.' Perhaps it would be safest not to give it this latter sense, unless the context clearly points to it. We did not suppose that Tacitus meant troops *d' elite*, like our regiments of guards, but picked soldiers from one or more corps.

(35). Donec . . . Galba inruenti turbæ neque ætate neque corpore sistens sella levaretur.

'Till Galba . . . as, from age and bodily weakness, he could not stand up against the crowd that was still rushing in, was elevated on a chair.'—C. & B.

N. thinks that *sistens* cannot mean 'standing up against.' It is certainly harsh, but Tacitus is very apt to use the simple for the compound verb; and it would not, we think, be quite impossible to take it as equivalent to *resistens*. This is, anyhow, better than taking *inruenti turbæ* as meaning *ab inruente turba* (N.'s suggestion). The Latin seems to us doubtful, and the sense impossible. The action of the crowd could not have been to lift Galba on to a chair. This must have been done purposely by his attendants, not by the unconscious pressure of the crowd.

(38). Una cohors togata.

'One half-armed cohort.'—C. & B.

'One cohort in the toga.'—N.

N. is more literal. But, as a matter of fact, the cohort was half-armed, and our version gives a more intelligible notion to the reader.

(40). Completis basilicis et templis, lugubri prospectu.

‘The halls and temples were thronged with spectators of this mournful sight.’—C. & B.

‘Were thronged, and mournful was the prospect (they offered).’—N.

We hesitated long about this passage, and decided at last to follow the view of the majority of commentators. Ritter, *e.g.*, has ‘adest spectator populus, ut in ludicro certamine, tristia ac lugubria prospiciens.’

(41). Curtii lacum.

‘The lake of Curtius.’—C. & B.

‘Basin.’—N.

We do not see the superiority of N.’s. The name was like that of ‘Ball’s Pond’ in London.

(42). Ante aedem divi Iulii iacuit primo ictu in poplitem, mox ab Iulio Caro . . . in utrumque latus transverberatus.

We are still inclined to connect *iacuit* closely with *primo ictu*, though N. thinks it belongs to *transverberatus*—‘The first blow felled him.’

(50). Utrasque impias preces, utraque detestanda vota inter duos, quorum bello solum id scires, deteriore fore, qui vicisset.

‘Prayers for either would be impious, vows for either a blasphemy, when from their conflict you can only learn that the conqueror must be the worse of the two.’—C. & B.

‘Prayers for either would be impious, when you have two men, in whose conflict you can only be assured of this, that he will be the worse who conquers.’—N.

We doubt whether *deteriorem* has such an active meaning as that which N. attributes to it—‘worse for

the Roman people.' It signifies 'worthless' rather than 'mischievous.'

(52). *Precarium seni imperium.*

'The empire is held on the precarious tenure of an aged life.'—C. & B.

'The old man's power is precarious.'—N.

We are surprised that so careful a student of Tacitus as N. does not see the emphatic position of *seni*. To suppose it a mere literary epithet of Galba is to show a certain want of perception of Tacitus's manner. Surely it must mean that the *imperium* was *precarium* because it was held by a *senex*.

(b). *Merito dubitasse Verginium, equestri familia, ignoto patre, imparem si recepisset imperium, tutum si recusasset.*

'It was well for Verginius to hesitate, the scion of a mere Equestrian family, and son of a father unknown to fame; he would have been unequal to empire had he accepted it, and yet been safe, though he refused it.'—C. & B.

We do not acknowledge the 'strange mistake' which N. here attributes to us. We were aware that the reader is put into Verginius's 'point of view,' but we might have expressed it more plainly.

(54). *Civitas Lingonum.*

'Chief town' is possibly better than 'state' here and elsewhere for *civitas*, though it does not express the whole meaning.

(57). *Instinctu et impetu et avaritia.*

We take *instinctu* to mean 'promptings from without.'

N. prefers to regard it as a synonym to *impetu*. It is scarcely in Tacitus's manner to use synonyms. We have followed in our rendering more than one trustworthy commentator. N. may compare *instinctu decurionum*, I, 70.

(67). Amoeno salubrium aquarum usu frequens.

‘Much resorted to as an agreeable watering-place.’—C. & B.

‘Much frequented for its delightfully situated medicinal waters.’—N.

A ‘watering place’ strictly means ‘a place where medicinal waters are drunk,’ though the term has come into more extended use.

(68). Non arma noscere.

‘Knew not how to use their arms.’—C. & B.

‘Could not distinguish arms (and so the corps of which they are distinctive).’—N.

Orelli quotes Duebner with approval, ‘Armis uti nesciebant.’ Perhaps this is rather more than Tacitus intended, and the meaning may be, as Ritter suggests, ‘they were not familiar with the use of arms.’ The words seem to us to be a strong way of saying that they (the Helvetii) had had no proper military training. We can hardly think that they have the special sense which N. puts on them. There would be nothing very strange in the Helvetii not being able to distinguish by their arms and equipments the various corps of a Roman army. In Agricola, 5, Tacitus says, ‘noscere provinciam, nosci exercitui,’ where ‘noscere’ and ‘nosci’ imply, we think, a familiar knowledge. We often say that a man knows nothing of a thing when we really mean that he knows it very poorly.

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(70). Subsignanum militem.

‘The reserves and the heavy infantry.’—C. & B.

N. remarks: ‘This is erroneous. The word *subsignanus* has no tactical meaning.’ We did not mean to give it any. The *subsignani* were (the word is certainly so used in places) soldiers who were released from the ordinary duties of the camp, intrenching, going on guard, &c., but kept *sub signis*, and used as a reserve.

(72). Disparibus causis.

‘A less worthy cause.’—C. & B.

‘Different.’—N.

‘Less worthy’ is not exactly equivalent to ‘unworthy,’ as N. suggests. But certainly the general joy felt at the escape of Celsus was ‘less worthy’ than the delight, however execrable, caused by the death of Tigellinus.

(76). Initio Karthagine orto neque expectata . . . proconsulis auctoritate: Crescens, etc.

Orelli punctuates the passage with a period at *orto*; and we translated accordingly.

(77). Nobiles adolescentulos avitis et paternis sacerdotiis in solacium recoluit.

‘He consoled the young nobles by *reviving* the sacerdotal offices held by their fathers.’—C. & B.

‘By investing them anew with the priestly offices of their fathers.’—N.

The version of *recoluit* which N. adopts certainly seems preferable. We considered it, but did not see our way clear to understanding what actually happened. What had become of the offices? Had they been bestowed on others, from whom they were now taken away? This would have been a stupendous revolution, shocking to the religious feeling of Rome.

(86.) Tiberis—qui proruto ponte ac strage obstantis molis refusus.

‘The river—broke down the wooden bridge, was checked by the heap of ruins across the current.’—C. & B.

‘Dammed by the destruction of the wooden bridge, and the sinking in of the mole which faced its bank.’—N.

We do not see that it is preferable to understand *molis* of the ‘mole.’ Tacitus would probably have given some more particulars if he had intended to mention another catastrophe besides that of the bridge.

(b). Quod iter belli esset obstructum, a fortuitis vel naturalibus causis in prodigium vertebatur.

N. thinks the translation of *a causis* as the inst. abl. ‘a strange error.’ We followed Orelli—certainly a respectable authority—who, as is clear from his punctuation, so construed the passage. *A* is sometimes used rather strangely with the abl. So in Ovid’s account of his early years we have: ‘Imus ad insignes urbis ab arte viros.’ But the punctuation suggested by N. is certainly attractive.

(87). Is urbanae militiae impiger, bellorum insolens, auctoritatem Paulini, vigorem Celsi, maturitatem Galli, ut cuique erat, criminando, quod facillimum factu est, pravus et callidus bonos et modestos anteibat.

N. prefers to take *quod facillimum factu est* of what follows. But surely this is a somewhat commonplace observation for Tacitus, that it is a very easy thing for an unscrupulous and crafty fellow to get the better of the conscientious and the good. There is more point in his remarking that it is a very easy thing for such a man to make capital for himself by exaggerating into faults the characteristic excellences of men of worth, representing, *e.g.*, energy as rashness.

(90). Quasi dictatorem Caesarem aut imperatorem Augustum prosequerentur, ita studiis votisque certabant.

‘As if they were applauding a Dictator like Caesar, or an Emperor like Augustus, they vied with each other in their zeal and good wishes.’—C. & B.

‘The people vied in acclamations and blessings [upon Otho], as though they were acclaiming a Dictator Caesar, or an Emperor Augustus.’—N.

We did not misconceive, as N. thinks, the meaning of the prefixes *dictatorem* and *imperatorem*. We had to put the passage into English, which N. certainly has not done.

ALFRED JOHN CHURCH.

WILLIAM JACKSON BRODRIBB.

AN EMENDATION.

IN Schmid's excellent work, 'die Gesetze der Angelsachsen' [Leipzig, 1858], he has given a copy of the Laws of William the Conqueror, in Old French and Latin, with a German translation. I share with him in the 'heilsame Scheu vor Conjecturen' (Pref. p. vii.), but there are some emendations which seem unmistakeably called for and self-evident. On p. 326 is the following passage, which gives scope for amelioration at least in one point:—

§ 5. Cil ki avoir rescut u chevals u
bos u vachees u berbiz u pors, que est
forfeng apelé en Engleis, cil ki s'
claimed durrad (al provost) pur la res-
cussiun VIII den., *i a tant n'i ait, mes*
qu'il i oust cent al maille, ne durrad
que VIII den.; e pur un pors I den., e
pur I berbiz I den., e issi tresque a VIII
pur chascune I den.; ne i a tant n'i
averad, ne durrad que VIII den.

Ita tamen ut ultra VIII denar. non
tribuat, quotquot averia sibi restitui
petierit.

This passage Schmid did not understand; he renders:—
"es mögen so viele sein als da wollen, aber möge er
100 *nach Geld* gerechnet haben, er soll nicht mehr als
8 Pfennige geben." He adds in a note:—"‘al maille,’
wörtlich: ‘nach dem Heller,’ verstehe ich so, wenn man
das eingefangene Vieh nach Geld berechnet." He further
adds that the sentence seems corrupt: naturally enough,
for it certainly is not very intelligible so taken.

This very passage was excerpted by Bartsch into his
'Chrestomathie de l'Ancien Français' (Leipzig, 1866), in
the following form (p. 39, 5): 'ja tant n'i ait, meis qu'il i oust

cent al maille, ne durrad que VIII den.' In the 'Glossaire' appended to the Chrestomathie, the word *maille* is explained as 'petite monnaie, eine kleine münze,' i.e., Schmid's 'farthing' (Heller). As I see the clause is still retained in the *fourth* edition [1880] of the 'Chrestomathie,' with the same explanation, based on Schmid's misunderstanding, it may not be amiss to correct the mistake.

The solution of the difficulty lies in reading *almaille*, i.e. *animal*, a not uncommon word. Reading therefore 'ja tant n'i ait, meis qu'il i oust cent *almaille*, ne durrad que VIII den,' I translate, 'no matter how many there be, *even*¹ though there were an hundred beasts, he shall only pay 8d.' which is exactly what the Latin says.

¹ For this use of *meis que*, 'even though,' see my *Vie de St. Auban*, 810, and note on 1114.

ROBERT ATKINSON.

NOTE ON ARIST., POL. VIII. (v.) 7.

ὥστε φθείροντες τοῖς καθ' ὑπεροχὴν νόμοις φθείρουσι τὰς πολιτείας.

UNDOUBTEDLY τοῖς νόμοις has the authority of the best MSS. Few, however, have been disposed to acquiesce (with Goettling and Susemihl) in the reading given above; and the usual course with editors has been to accept, for φθείροντες of the MSS, χαίροντες, the conjecture of Lambinus. But this is a very daring step, and offers no answer to the question, Whence arose the corruption? Now, τοὺς . . . νόμους for τοῖς . . . νόμοις has the authority of the Codex Reginensis, Codex Lipsiensis, the ancient Latin translation of Leonardus Aretinus, and the Aldine edition.

My theory is that τοὺς . . . νόμους is right, and that for φθείροντες we should read φθείρονται ἐς, and supply a τε before τὰς πολιτείας. When φθείρονται ἐς was corrupted into φθείροντες, the corruption of τοὺς νόμους into τοῖς νόμοις would follow almost as a matter of course. Read therefore—

ὥστε φθείρονται ἐς τοὺς καθ' ὑπεροχὴν νόμους, φθείρουσί τε τὰς πολιτείας.

Translate: "So they rush headlong into laws based on their superiority, and so destroy the constitution."

The comparative rarity of the phrase φθείρονται ἐς would easily account for its corruption into φθείροντες. Cp. Dem. 560, 10, for this use of φθείρεσθαι.

ROBERT YELVERTON TYRRELL.

PROPERTIANA : BAEHRENS AND THE CODEX
NEAPOLITANUS.

IF there is a principle now distinctly agreed upon in criticism, it is, that the first thing to be done by an editor is to arrive at an estimate of the comparative merits of the MSS. containing the works of the author he is about to publish. Veneration for a manuscript, merely because it is a manuscript, is a thing of the past: and the votes of copyists have long since been weighed, not counted.

Lachmann saw and clearly enunciated this principle in the preface to his first edition, of 1816; and setting about his work, as he himself says, as though Propertius had never been edited before, he made it his first duty to classify the MSS. according to their merits.

Unfortunately his judgment at that time was not matured; and by some extraordinary hallucination he gave the first place to the Groningen MS., one of the latest and worst manuscripts in existence. He had never seen this MS., but relied on an old collation of Schrader's; and, deceived by one or two plausible interpolations, he delivered this unfortunate verdict, which resulted in throwing back the criticism of Propertius at least a quarter of a century. Lachmann, however, made some atonement for this egregious blunder by placing the Naples MS. in the second place. The attention of subsequent critics was drawn to this manuscript, and, once drawn there, was detained by its intrinsic merits. Lachmann, in his second edition, which is in many points a recantation of his first,

and Hertzberg, both allow great weight to the Neapolitanus. Keil and Haupt exposed the pretensions of the Groninganus, and asserted the supremacy of the Neapolitanus; and their judgment has been endorsed by Heimreich, L. Mueller, and the best German scholars. Heimreich, indeed, and G. Wolff, went so far as to say that N itself is the Propertian archetype; and that wherever its gaps are found filled up in other manuscripts, the portions supplied are interpolations—a conclusion in which L. Mueller rightly forbids us to acquiesce. It is, however, a conclusion which will yet have supporters, and which can be defended by more plausible arguments than Baehrens' new theory can command. In my edition of Propertius, published almost simultaneously with that of Baehrens, I leaned so entirely on the support of N, that I printed everything in italics that it omitted. In fact the criticism of Propertius was arriving, or had arrived, at this point, that the voice of the Naples MS. had begun to be regarded as worth more than all the other manuscripts put together. At this point the edition of Professor Æmilius Baehrens has been published, a work which will materially affect the criticism of Propertius, if the conclusions arrived at by the learned editor be accepted.

It is a pity that Hertzberg has taught us to disbelieve the story that a battered and worm-eaten copy of the poems of Propertius was found by Jovianus Pontanus in a wine-cellar. There would be a happy irony in the fate that brought this devotee of Bacchus and Venus to his literary resurrection after sleeping for years, perhaps centuries, in a wine-vault. But whether it had lain in a wine-vault or not, certainly it was a battered and worm-eaten copy that, late in the Middle Ages, probably during some part of the fourteenth century, emerged from its hiding-place in some monastery, and was destined to become the only archetype of the poems of Propertius. This arche-

type has probably long since perished. But respecting it Baehrens has come to the following conclusions. He believes that two copies of this archetype were made, about the middle of the fourteenth century, and that consequently there are two families of manuscripts representing it.

Each of these families is represented by two manuscripts.

To the first family belong :—

(1). A, the codex Vossianus, called by Burmann Vossianus secundus. This MS. Baehrens declares, as the result of his repeated examinations, must have been written about the year 1360. The MS., certainly a very good one, stops at the 63rd verse of the first elegy of the second book.

(2). F (Florentinus). This MS. gives us some internal evidence of its date; it belonged, according to an entry in the end of the book, to Colucius Salutatius, Chancellor of Florence, who died in 1406. F may have been then, probably, as Baehrens states, written in the very beginning of the fifteenth century.

To the second, hitherto unrecognised family, belong :—

(1). V (codex Ottoboniano-Vaticanus). This MS., Baehrens informs us, was written at the end of the fourteenth century, but he does not tell us on what grounds he has formed his belief.

(2). D (Daventrianus), written in Italy, *circ.* 1410–1420. This MS. is very highly rated by Baehrens, who finds fault with Lachmann for his condemnation of it, and says: ‘Est enim hic unus ex optimis codicibus Propertianis, dignusque qui tandem suo tribuatur honori.’

From these four MSS., the consensus of which he terms O, the archetype of Propertius is to be reconstructed, says Baehrens. Now, if this be true, it is evident that a new departure must be taken in Propertian criticism, for the reader will see with surprise that the Neapolitanus is not

included in the list; and although considered by Baehrens the best of the interpolated codices, it is not considered by him of primary importance in the reconstruction of the archetype.

Now, had Baehrens been content with pointing out that his four MSS. possess hitherto unrecognised merits, he would have rendered considerable service to Propertian criticism. But, with the characteristic anxiety of many Germans to overthrow all that has been ever written before them, he has attempted to prove too much, and his refutation is easily supplied from his own pages. Before proceeding to indicate some of the assailable points in Baehrens' armour, I will first briefly state the conclusion which I myself hold about Propertian scripture.

First, the Neapolitanus is much the best of the manuscripts at present known to scholars; secondly, Baehrens' family AFN is much superior to his family DV. Inasmuch as more than one—I cannot say how many copies—of the archetype were probably made, the assistance of no MS. is to be rashly rejected. With these modest conclusions I am quite content; and I will leave abler critics to pelt epithets such as *sordes*, *quisquiliae*, and others of the same mint, at the codex Perusinus, written by one of the best scholars of his day—a man who had access to many libraries, and whose honesty is tested by his careful recording of various marginal readings, and the preservation of many unmeaning ones;—a MS. written only some fifty years later than the Daventrianus, which Baehrens considers of the highest value in the reconstruction of his archetype.

Baehrens' theory has landed him in many inconsistencies, so glaring that they can scarcely escape the most careless reader. The position he accords to N is consequently somewhat difficult to determine; but his destructive view seems fairly summed up in the following sentence:—

Ubi solus pro se stat N sanæ artis praecepta omnia suadent ne quid priscae scripturae forte fortuna servatum statuamus ; and again, nusquam quidquam esse dandum illius lectionibus eis quibus ceterorum librorum consensus obstat.

As I believe that this conclusion is nearly the reverse of the truth, and would inflict serious damage on Proper-tian criticism, were it acquiesced in from deference to any authority, I think it highly expedient to point out some reasons for doubting its truth, first laying before the reader what I know of N. I collated this MS. at Wolfenbüttel in the spring of 1878, as carefully as I could in three days. I consoled myself for this somewhat hasty revision by the fact that Hertzberg had asserted that his collation of N was perfectly accurate. It was not, as I found : I have recorded several not unimportant discrepancies. Baehrens' recension, again, is more accurate than mine, and no wonder, as he had the MS. in his keeping as long as he liked. But he has made one or two mistakes which I can point out ; the most important perhaps being his statement, in which he agrees with Hertzberg, that N has *properare* in III. xxi. 21. I can answer for it that it has *properate*.

N is externally a handsome manuscript of octavo shape, very clearly written, with scarcely any marginal readings or glosses.

The question of the age of N is one to which very different answers have been given. Keil placed it in the twelfth century ; Lachmann and Hertzberg in the thirteenth ; L. Mueller in the fourteenth, or more probably in the fifteenth century ; Baehrens affirms that it was written after 1430. In my opinion it was written before the end of the fourteenth century.

It is somewhat amusing to examine the arguments advanced by Baehrens to establish his theory of the lateness of N.

His first is the parchment: 'Certe ipsae cartae non priores saeculo XV.' This ought to settle the question, surely: for the MS. is certainly not older than the paper it was written on; and we may be spared the other reasons, just as the mayor of the French town was pardoned by the king for not firing a salute when he had no gunpowder, and was excused giving his eleven other reasons for not doing so. But I presume the question of the antiquity of the parchment had not escaped Keil, or Lachmann, or Hertzberg. In fact, Baehrens' statement is simply a hasty enlargement of Mueller's more modest suggestion: 'Quid quod ipsae membranae saeculum XV potius quam XIII referre videbantur?' This hesitating suggestion advanced by Mueller has swelled into a dogmatic assertion with Baehrens: 'certe ipsae cartae non priores saeculo XV.'

Again, following L. Mueller, Baehrens urges the ornamental initial letters, painted in green and red and blue. L. Mueller had urged that there was no example of such adornment on MSS. of classical poets of the thirteenth century. This is something for Mueller, who is arguing against Lachmann's early dating; it is nothing for Baehrens, who wants to place his MS. in 1430 or later, and whose theory must fall if N was written before 1400. For were there not these illuminated letters in classical MSS. in the end of the fourteenth century? Baehrens' third and last argument is drawn from the fact that the name *Manetti* is written in the last page of N. A certain *Manetti* died at Naples in 1459. On these three arguments Baehrens rests his theory that N was written after 1430: three utterly futile arguments, in my opinion.

For that N is more ancient than O is proved, as regards external evidence, by the facts, first, that the writing is of a more ancient type, which is admitted; secondly, that the old spelling is in many instances retained by N, and N alone, which is admitted; thirdly, that N is destitute of the

modern figments which in O are exhibited in the titles of the book and of the separate elegies: O having the exploded *Aurelii*, while N has simply *Incipit Propertius*; O having the absurd titles for the poems invented by stupid scribes, such as the ludicrous *ad heremium Demophoontem*, ii. 22, N having none.

But it is, after all, on internal evidence that the question of the supremacy of O or N must be decided. And as this investigation can only be carried on in one way—by contrasting the divergent readings of O and of N—I will here remark on some of the more important disagreements.

The great value of Baehrens' edition consists in this, that it supplies us with the means of instituting this comparison. Before Baehrens' edition was published we were at a loss to know with what respectable families to compare N: this want he has now supplied; and I think, by carefully studying some of the more important discrepancies, we shall arrive at some curious conclusions with respect to the archetype itself.

I. viii. 21, 22.

Nam me non ullae poterunt corrumpere taedae
Quin ego, vita, tuo limine vera querar.

This is now the commonly accepted reading. Both O and N, however (also P), give *de te* for *taedae*, and *verba* for *vera*. O, however (see Baehrens' appendix), gives *tuta* for *vita* of N. Hence Baehrens reads:

Nam me non ullae poterunt corrumpere, de te
Quin arguta tuo limine verba querar.

Now Baehrens *may* be right in keeping *de te*, as 'queri de aliquo' is a regular Latin expression, but I do not think he is. The Italian copyists who changed *de te* to *taedae*

knew what they were about. Hertzberg totally misunderstands *taedae*, explaining it as 'ardentis amoris insigne.' *Taedae* are the marriage torches. Twenty passages from Ovid might be quoted to show this, but one will be enough. Hypsipyle says, contrasting her own lawful marriage with Medea's illicit connexion with Jason:

Turpiter illa virum cognovit adultera virgo
Me tibi, teque mihi *taeda pudica* dedit.

And what Propertius here says is, that Cynthia need not fear his getting married in her absence. This he is found again insisting on, II. vii. 7-10:

Nam citius paterer caput hoc discedere collo,
Quam possem nuptae perdere amore faces,
Aut ego transirem tua limina clausa maritus.

But I consider the retention of *de te* a small blemish compared with the singular want of sagacity shown by Baehrens in his emendation of the second line. He has addressed himself to the wrong point, led astray by his infatuation in favour of O. *Vera* for *verba*, the correction of Passeratius, is rendered certain to my mind by the facts, first, that *verba* and *vera* are repeatedly confounded in Propertius: see III. xxiv. 12; I. xiii. 17; secondly, that the meaning is exactly what it should be, and is established by a comparison with other passages in Latin poetry: by Propertius' '*veris* animis est questa puella'; by Catullus' '*vera* gemunt' and others. Now if *tuta* is in O, instead of affording ground for building an emendation on, it at once damns O; for is it not obvious that a copyist thought *verba* wanted an epithet, and corrected *vita* to *tuta*, having, as is usual with many copyists, no regard to the meaning of the passage, but merely to the line, or the two or three words immediately before his eyes: 'Safe on thy threshold'!

II. vii. 3.

Gavisa est certe sublatam Cynthia legem
 Qua quondam edicta flemus uterque diu,
 Ni nos divideret. quamvis diducere amantes
 Non queat invitos Iuppiter ipse duos.

So N: but in the third line O, instead of *Ni*, has *Quis*. Baehrens, instead of seeing what I am pretty sure is the true explanation of this, that *quis* is a correction of the copyist, who did not notice that the sense ran on from the previous line, and paraphrased an idea that was familiar to him: '*Quis separabit*'? has built an emendation on it: '*Quod* nos divideret'—an emendation which, like many of his founded on O, will prove to be built on the sand.

I pass over without comment II. viii. 25, where Baehrens strangely prefers *efficies* of O to *effugies* of N; and II. ix. 12, where he prefers *Appositum* of O to *Propositum* of N.

 II. xv. 49.

Tu modo, dum lucet, fructum ne desere vitae:
 Omnia si dederis oscula pauca dabis.

So N; and so I print, as I loyally follow N. L. Mueller, however, has accused N of dishonesty here, and of having corrected *licet* (which is the reading of O, save that F has *lucet* as a variant) from St. John, ix. 4. He reads:

Tu modo, dum licet o fructum ne desere vitae,

and Baehrens follows him, and, I presume, adopts his reasoning. I confess I am not certain of more than one thing, namely, that the reading of Baehrens and Mueller is extremely inelegant. But I think *lucet* is sound; the fact that Propertius in the same poem has used this line,

24, *supra*, 'Nox tibi longa venit nec reditura dies,' being just sufficient to defend this rather strange use of *lucet*, as Hertzberg has pointed out. It would be amply sufficient to defend it, did the two passages come a little closer together. I would, therefore, with this object in view, propose a good deal of transposition in this poem—a method of treatment I am loth to resort to, yet often necessary in dealing with Propertius. For, consider the verses from the twenty-third to the twenty-eighth of this poem :

Dum nos fata sinunt oculos satiemus amore :
 Nox tibi longa venit nec reditura dies.
 Atque utinam haerentes sic nos vincire catena
 Vellet uti numquam solveret ulla dies.
 Exemplo iunctae tibi sint in amore columbae
 Masculus et totum femina coniugium.

That there has been displacement here is shown by the two *dies* coming so close together, and by the fact that the comparison indicated by *sic* in the third line is not to be found in the preceding distich, where it should be, but in the succeeding. For surely the doves 'in amore iunctae' are the instance of comparison.

I propose, then, to insert the last four lines of the poem after the twenty-fourth; to insert the forty-ninth and fiftieth verses next; and to transpose the last two distichs written above. The passage will then read:—

Dum nos fata sinunt oculos satiemus amore.
Nox tibi longa venit, nec reditura dies :
 At veluti folia arentis liquere corollas,
 Quae passim calathis strata natare vides,
 Sic nobis qui nunc magnum speramus amantes
 Forsitan includet crastina fata dies.
 Tu modo, *dum lucet*, fructum ne desere vitae,
 Omnia si dederis oscula pauca dabis.

Exemplo iunctae tibi sint in amore *columbae*
 Masculus et totum femina coniugium.
 Atque utinam haerentes *sic* nos vincere catena
 Vellet uti numquam solveret ulla dies.

Everything is smooth now. I adopt *at* (O) for *ac* (N) in the third line above—a common and trivial variation, and Baehrens' correction of 27. Surely the bringing the *oscula* so close to the *columbae* is also a point in favour of the change: the dove

quae multo dicitur improbius
 Oscula mordenti semper decerpere rostro
 Quam quae praecipue multivola est mulier.

II. xviii. 5.

Quid mea si canis aetas canesceret annis,
 Et faceret scissas languida ruga genas?

So N. O gives for the first line:

Quid si iam canis aetas mea caneret annis:

and Baehrens reads, with Bentley—

Quid si iam canis aetas mea curreret annis,

remarking of N that it is 'in toto loco interpolatus.' I fear N is interpolated here; but so is O. This is one of those passages where we must scrutinise our MSS. carefully, as N and O here diverge widely, and the divergence cannot be accounted for without supposing some corruption or illegibility in the archetype, differently emended by the scribes of O and of N.

I think it likely that the line originally was

Quid mea si canis aetas marceret et annis.

I think, then, that *et* dropped out after *-et*, and *marceret* was changed to *caneret* owing to the proximity of *canis*.

Thus there was presented in the archetype to the copyists of the two families for emendation :

Quid mea si canis aetas caneret annis.

They both emended it wrongly ; but O goes much farther from the archetype than N.

With *marceret*, cf. Lucretius, iii. 946 ; Ov. Am. i. 14, 41. In both passages *annis* is joined with it. *Marcesceret* was conjectured by Heinsius : but *canis* is a noun, and must be separated from *annis* by *et*.

II. xxiii. 21, 22.

Et quas Euphrates et quas mihi misit Orontes,
Me *iuerint* : nolim furta pudica tori.

O has *capiant*. N has *iuerint*, 'interpolate,' Baehrens says. But which is more likely to have been in the archetype, the easy *capiant* or the hard and unmetrical *iuerint*, pointing to *iuerint*? Probably *capiant* was a marginal reading.

II. xxiv. 29, 30.

Iam tibi Iasonia nota est Medea carina,
Et modo servato sola relictā viro.

So N. O gives *ab infido* instead of *servato*, with the exception that F omits it altogether, Baehrens supposes on account of the copyist's eyes catching the *do* in *modo*. There are, however, many omissions in F, the result of mere carelessness, but let us grant that O had *ab infido*. Is there anything to choose between the two? Very little, I think. If anything, the balance seems to me slightly in

favour of N. 'Abandoned by the husband she had lately saved' seems to be just a shade better than 'presently abandoned by her unfaithful husband.' But either one or the other may be a correction: or this again may be one of those passages where the archetype was itself obscure or corrupt, and where we must be more than usually cautious. This is rendered more likely by the fact that the Hamburgensis has *esonio*.¹

And now a few words as to the sense. Baehrens, on whom many of the niceties of Propertian diction seem thrown away, does not see that the reading of all good MSS. in the first line is perfect. 'Medea and Jason's bark is an old story well known to you by this time (so I need not dwell on it).' *Jam* and *novi* are repeatedly joined together, and it is marvellous how a stickler for any manuscript authority, as Baehrens sometimes shows himself, can reconcile to his conscience his emendation:

Quam cito Iasonia vecta est Medea carina.

¹ A new idea strikes me, that in this line Propertius, who has mentioned three instances of male inconstancy, may here be mentioning a fourth—namely, the desertion of Dido by Æneas. Suppose we read something of this sort:—

Et Dido ingrato sola relictæ viro.

Suppose that the first syllable of Dido was obscured in the worm-eaten archetype: suppose it was corrected to *modo*: then we can easily see a reason why both the variants *servato* and *ab infido* should have arisen: for

as *ingrato* (or *a duro*) would not do, one copyist might correct to the one, another to the other.

I do not press the insertion of *Dido*: but it is worth considering; and there is another argument which I might urge to prove that Dido, not Medea, is referred to in the fourth line; it is contained in the word *relictæ*. It is obvious that this is far more properly used of a woman who is left alone by a man who sails away, as Dido was left by Æneas, than of a woman who is turned out of doors by her husband, as Medea was by Jason.

II. XXV. 2.

Unica nata meo pulcherrima cura dolori,
Excludit quoniam sors mea saepe venit.

So O, apparently : but N has *venit*, whence Madvig has deduced what is clearly the true reading,

Excludi quoniam sors mea saepe venit.

Baehrens, of course, follows O.

In II. xxv. 42, *dulcis* (O) smacks more of the scribe than *ducit* (N), although Baehrens gives the preference to the former. And how can he prefer *prae invidia* of O to *ob invidiam* of N in II. xxvi. 15 ?

Et tibi ob invidiam Nereides increpitarent.

Surely *prae invidia increpitare* is scarcely good Latin : and it is easy to suppose that, owing to the two *bi*'s coming so closely together, the scribe of the O family first wrote down 'et tibinvidiam,' corrected afterwards to *et tibi prae invidia*. Again in II. xxviii. 21 :

Andromede monstribus fuerat devota marinis,

O gives *monstrata*, and we cannot but wonder that a critic should think it necessary to look for any cause for the absurd *monstrata* than the preceding *monstribus*, which was ringing in the imagination of the scribe. Baehrens, however, thinks he is justified by the concurrence of O in reading *sacrata*.

II. xxvii. 7.

Rursus et obiectum flemus capiti esse tumultum.

Here N has *fletus caput*, and from this apparently up-

meaning reading Lucian Mueller has, in my opinion, deduced the true reading,

Rursus et obiectum fletis caput esse tumultu.

Tumultu is the dative, the form in *u* being the only form used by Propertius. The other copyists, not seeing this, took *tumultu* to be *tumultū* (tumultum), and of course changed *caput* to *capiti*. It appears to me to be sense to talk of 'the head being exposed to tumult,' but nonsense to talk of 'tumult being exposed to the head.'

Unfortunately, N is not absolutely unique here, as F, belonging to the same family as N, also gives *caput* (with *flemus*).

The next is an important passage, where the divergence between O and N again leads me to suspect corruption in the archetype.

II. XXIX. I.

Hesterna, mea lux, cum potus nocte vagarer
 Nec me servorum duceret ulla manus
 Obvia nescio quot pueri mihi turba minuta
 Venerat: hos vetuit me numerare timor.

Hesterna has been changed to *extrema* by Heinsius—a change demanded by the last line of the poem—

Ex illo felix nox mihi nulla fuit.

This shows that some time had elapsed since the adventure here described. The words are often confounded. That, however, is not the main point. O gives *modo lux* against *mea lux* of N; and Baehrens has well pointed out that *mea lux* is unsound, as Cynthia is not addressed in the

poem, which is a narration of a quarrel with her which still lasted. He therefore reads with much cleverness :

Extrema modo cum perpotus nocte vagarer,

supposing *p* (*per*) to have dropped out accidentally before the *p* in *potus*. Against his reading, however, it may be urged that the participle *perpotus* does not seem to occur ; and what is of more importance, it is scarcely credible that the honest scribe of N saw *modo* before him in the archetype, and deliberately changed it to *mea*. I would rather suppose that the verse in the archetype ran thus :

Extrema cum potus nocte vagarer,

and that *modo* was a clumsy gloss attempting to make the verse its proper length, and *mea lux* another ; and that the scribe of the O family took down *modo lux*, the N scribe *mea lux*.

The original verse as it came from the pen of Propertius, I take it, was—

Extrema CAMPO cum potus nocte vagarer.

Propertius was out on one of his nocturnal expeditions in quest of the ‘viles puellae’ mentioned in II. xxiii. : cf. vs. 14, *infra*—

At tu nescio quas quaeris inepte foris.

The campus Martius may have been a nocturnal haunt of these Phyllides ; cf. II. xxiii. 6, *supra*, ‘campo quo movet illa pedes’ (better *qua*). *Campo* fell out before *cum po*—

II. xxix. 41.

Sic ego tam sancti custode eludor amoris
Ex illo felix nox mihi nulla fuit.

This is my own reading : ‘Thus I am eluded or baffled by one who guards her love so strictly.’ *Eludo* is a word

used by both Propertius and Ovid in the sense required here, and the omission of the preposition in such passages is rather the rule than the reverse with Ovid (Her. v. 75, *desertaque coniuge*). N has *custode reludor*, which was probably in the archetype, and which is nonsense. The *re* was probably inserted to help out the metre, one *e* having dropped out. But here D, V, and F go much further from the truth than N; D and V giving *custos recludor*, F *custodis rector*: Baehrens reads *cultor secludor*, which has no foundation in any MS.

II. XXX. 15-24.

Illorum antiquis onerantur legibus aures :
 Hic locus est, in quo, tibia docta, sonas,
 Quae non iure vado Maeandri iacta natasti,
 Turpia cum faceret Palladis ora tumor.
Num, iam, dure, paras Phrygias nunc ire per undas
 Et petere Hyrcani litora nauta maris,
 Spargereque alterna communes caede Penates
 Et ferre ad patrios praemia dira Lares !
 Una contentum pudeat me vivere amica ?
 Hoc si crimen erit, crimen Amoris erit.

In the italicised portion of the fifth verse above, N gives *Non tamen immerito*; and this is certainly nonsense; and this passage is one of the few passages in Propertius where N goes very far astray. The cause is not, however, so very far to seek as some have supposed. *Immerito* was a gloss on *non iure* in the third verse, and N thought this was a correction which he was bound to bring into his text. O gives *Nunc tu dura*: *iam* is found in some MS. *Num* and *dure* are corrections of later scholars. This is a passage where N is interpolated, but not wilfully, and where O, but not O alone, preserves the vestiges of truth. I cannot understand how Baehrens can retain *dura*. Does

he acquiesce in Lachmann's theory—the ludicrous theory of his first edition—abandoned, like nearly all his points, in his second—that Cynthia had expressed her intention of joining in a military expedition against the Parthians? I could as well imagine Doll Tearsheet applying for a charge of foot in the Agincourt expedition. Lachmann, in his second edition—of which second edition Baehrens seems to know little—reads *dure*, and with *dure* the whole tenor of the poem is quite intelligible. It is an address of remonstrance by the poet to himself for thinking of leaving Rome, and taking part in an expedition to the East.

In II. xxxii. 5, Baehrens, with strange inconsistency, against *Cur vatem* of O, reads *cur tua te*, which is a very bad reading; but for which he can only look for support in the *Curua te* of N, which, however, I think points to *cur vatem*.

Also, in II. xxxii. 22, he reads *meretur*, with N, against *mereris* of O; rightly, I think.

II. xxxii. 31.

Tyndaris externo patriam mutavit amore,
 Et sine decreto viva reducta domum est.
 Ipsa Venus fertur corrupta libidine Martis,
 Nec minus in caelo semper honesta fuit:
Quamvis Ida Parim pastorem dicat amasse.
 Atque inter pecudes accubuisse deam.
 Hoc et Hamadryadum spectavit turba sororum,
 Silenique senes, et pater ipse chori,
 Cum quibus Idaeo legisti poma sub antro,
 Subposita excipiens Naica dona manu.
 An quisquam in tanto stuprorum examine quaerit:
 'Cur haec tam dives? quis dedit? unde dedit?'

Fertur is the reading of N against *quamvis* of O and all other MSS.; and surely it is more likely than that

quamvis should come so soon before another *quamvis*. Indeed the more I think of this passage, the more I regret that I did not boldly read my own conjecture, *Pegasida*, for the second *quamvis*, making the following lines refer, as they naturally do, to Oenone. The *ida* of *Pegasida* having been absorbed by *Ida*, *quamvis* may have been written in the margin of the archetype as a correction, and it may have been copied down in *both* places by the O family.¹

II. xxxiii. 37, 38.

Cum tua praependent demissae in pocula sertae,
Et mea deducta carmina voce legis.

So N, solus. O and all other MSS. give *demissa*—*serta*, the common form. But the grammarian Charisius, who lived about the latter half of the fourth century, quotes this very line from Propertius to show that he used the feminine form. Baehrens, who reads *sertae*, is not a whit influenced in favour of N thereby, but says that N is *ex Charisio interpolatus*. This preposterous mode of argument would prove anything. Verily, the scribe of N must have been a learned man. Much in the same way Baehrens gets over the difficulty that N preserves the old spelling much

¹ Baehrens, who throughout his preface has displayed considerable petulance towards me, I presume on account of my remarks on his Catullus in my review of Ellis's work in *Hermathena*, thus writes of my conjecture *Pegasida* :— 'unus his ultimis annis A. Palmer nihil ut totius loci ita versuum 37-40, pondus respiciens Paridis cum Oenone amorem ab hoc loco alienissimum intrudebat ita 'Pegasida Ida

Parim' ne nova quidem coniectura cum iam dudum Astius similia ('Pegasi, te Ida P. p. dicit—deae') futiliter coniecisset.' I had never heard of Ast's emendation; and even had I known it, my emendation was essentially new; the entire base for it, the absorption of *ida*, being lacking in Ast's: and the lines the gist of which Baehrens says I did not consider were the very lines which led me to my emendation.

more frequently than the other MSS., because he was 'haud indoctus.' Surely this would have the reverse effect. If N was written after 1430, as Baehrens tells us, the whole learning of the age was for the new forms. Unless his learning was far beyond the learning of his age he most certainly would have given us *nequicquam*, then universally accepted by the learned as the most correct form, and not *nequiquam*, which the learned condemned.

II. xxxiv. 3, 4.

Expertus dico, nemo est in amore fidelis :
Formosam raro non sibi quisque petit.

So N and most MSS. ; I believe, rightly. O gives 'Et formam raro non sibi quisque petit,' a ludicrous interpolation. Baehrens does not seem to have recognised the fact that it was an irresistible temptation with a certain class of scribes to turn, when they could, a line into a gnomic form, utterly regardless of the tenor of the passage: he reads *formam*, taking it to mean the same thing as *Formosam*. The O transcriber may have had Juvenal's *Formam optat pueris*, x. 289, in his head.

III. i. 23, 24.

Omnia post obitum fingit maiora vetustas,
Maius ab exequiis nomen in ora venit.

This is one of the very few passages where N seems certainly interpolated. It has *Formae* for *Omnia*, and *vetustae*. O (and all other MSS.) have the true reading.

III. vi. 22.

Ille potest nullo miseram me linquere facto,
 Et qualem nullo dicere habere domo.
 Gaudet me vacuo solam tabescere facto.
 Si placet, insultet, Lygdame, morte mea.
 Non me moribus illa, sed herbis improba vicit.

I have printed the second line of the above as N alone of all MSS. has it, according to Baehrens' own recension; and from a close scrutiny of it I have, I think, deduced the true reading, which was hopelessly obscured in all other copies, which give *Aequalem* and *nulla*. For what is the meaning wanted? Some words which denote that Propertius has attached himself to a rival. Baehrens saw that this meaning is wanted, but gives a very improbable reading indeed: 'Rivalem nullam dicere habere domi' interrogatively: wandering much farther from the MSS. than the laws of criticism warrant, and giving a most awkward interrogative sense to the line. As I have read in my edition, changing only two letters in *nullo*, a very easy construction and excellent meaning is attained:

Et qualem NOLO dicere habere domo.

I have supported my conjecture by Juvenal's 'aut pastor fuit, aut illud quod dicere nolo,' and by Catullus' 'Praeterea addebat quendam quem dicere nolo.' Better sense could not be given: Cynthia, with all a woman's malice, declares her rival's character to be so bad that she would not soil her lips by mentioning who or what she was. There is one weak point in my reading which, however, does not affect the character of N; it is the word *domo*. I have left it untouched, because I was not quite sure whether to change it to *domi*, as Baehrens does, or to

substitute *amare* for *habere*. Cf. II. xxiv. 24, *In primis una discat amare domo*. Or again, *domo* may boldly be changed to *potes*: for the noun at the end of the line may have been altogether induced by the corruption *nullo*, which seemed to demand a noun.

Nowhere is a case, if my theory be true, where 'pro se solus stat N', and where N alone preserves a clue to the true reading, and that in a manner where interpolation cannot be suspected. This single passage is, I hold, sufficient to upset Baehrens' theory, even if it stood alone.

VIII. ii. 46.

/ *III. vii.*

Quod si contentus patrios bove verteret agros,
Verbaque duxisset pondus habere mea,
Viveret ante suos dulcis conviva Penates,
Pauper, at in terra, nil ubi flere potest.

Here, again, Baehrens prefers O to N, wrongly, as I think. The fourth line has been a puzzle to editors. I have printed it as N gives it. Many editors—I myself among the number—have adopted *flare* from Jacob, translating 'where the blast has no power'; but this is scarcely true. I think a good sense may be got out of the line by reading *in terris, potes*, and pointing the verse interrogatively:—

Pauper: at in terris nil ubi flere potes?

'Not rich, I grant you: but where in the whole world can you find no cause for complaining?'

I do not advocate the claims of this conjecture very earnestly, but I am certain of one thing, that *ubi* is sound. Mr. Postgate has lately conjectured *sat est*, which may possibly be right.

Now O reads *nisi* for *ubi*: a silly and senseless interpolation. Surely it does not take a very acute critic to see that the scribe who gave this line—

Pauper at in terra nil nisi flere potest—

gave this sense to it utterly regardless of all connexion with the tenor of the poem: 'But the poor man can do nothing in the world but weep'! However, Baehrens, who will have it that O represents the archetype, founds his reading on this imbecility, reading

Pauper, at in terra nil nisi fleret opes.

In III. ix. 9. N has *animosa effingere signa*, which is exactly what is wanted. O has *animosa fingere signa*. Baehrens, with the utmost coolness, says N is interpolated, and reads *animose fingere signa*—a thoroughly bad reading, but which, if it were right, would derive all its support from N.

In III. x. 25,

Dulciaque ingratos adimant convivia somnos,

where O has *que*, but N omits it, it is quite possible the true reading is to be extracted from N: *Dulcia iam ingratos*, or *Dulcia non gratos*.

III. xiv. 11, *seqq.*

This is one of those passages where O and N widely diverge, and where, consequently, we must suspect corruption in the archetype.

Gyrum pulsat equis, niveum latus ense revincit,
 Virgineumque cavo protegit aere caput,
 Qualis Amazonidum nudatis bellica mammis
 Thermodontiacis turba lavatur aquis,
 Et modo Taygeti, crines aspersa pruina,
 Sectatur patrios per iuga longa canes;

Qualis et Eurotae Pollux et Castor harenis,
Hic victor pugnīs, ille futurus equis,
Inter quos Helene nudis capere arma papillis
Fertur nec fratres emuisse deos.

I have written the above passage as it appears in N (save *habenīs* for *harenīs*), and as Lachmann (ed. 2) and Hertzberg have edited it. O has in v. 19 *nudis armata capillis* (DV), or *nudis est armata capillis* (F). Add to this that Hertzberg's Hamburgensis has *nudis et arma*.

Baehrens places 15, 16 before 13, 14. He ought, I think, to place them before 11, 12. He reads *lavantur* with DV in 14; *talis* for *qualis* in 17, and *fluidis versata capillis* in 19.

As to *lavantur* for *lavatur*, the difference is a trifle, and either singular or plural is good Latin with *turba*.

By changing *talis* to *qualis* the absurdity of comparing the Spartan women with Amazons *bathing* is indeed avoided. This was an absurdity; for the Amazons, when bathing, were no more like the Spartan women bathing than any other women bathing, I take it. But a still greater absurdity is introduced—the comparison of the Dioscuri when bathing to the Amazons bathing. Baehrens then goes on to say that the Spartan women bathed along with the men, and that this was the thing Propertius says Helen did not blush at, as she moved '*fluidis versata capillis*,' according to his own improbable reading, among the men.

Baehrens has here, I think, fallen into a trap. There is no point of comparison in *lavatur*. The Spartan women are compared, as engaging in martial exercises, with the Amazon hordes, who, the poet casually remarks, bathe in the waters of the Thermodon. They are then compared from the same point of view as engaging, namely, in martial exercises, with Castor and Pollux, *Eurotae harenis*, that is,

the level exercising grounds on the banks of the Eurotas. There is not a word about their bathing. But there is great difficulty in the reading of 19.

Can it be supposed that an honest scribe like the copyist of N would have written *capere arma papillis* if *armata capillis*, making a completed verse, was in his archetype?

On the other hand, can it be supposed that a generally faithful scribe like the scribe of F would have written the unmetrical *est armata* if *capere arma*, making metre and sense, was in the archetype?

Or that the generally honest Hamburgensis would have given *nudis et arma* if *capere arma* was in the archetype?

I can come to no other conclusion than that the line was defective in the archetype itself, and that it has been wrongly emended in both N (*capere arma*) and DV (*armata*). F and the Hamburgensis probably are nearest to the truth—the latter most likely the closer of the two. The line, then, that the emendator should try his hand on is :

Inter quos Helene nudis et arma capillis.

N wrongly emended by substituting *capere* for *et*. DV wrongly emended by giving *armata*. *Papillis* for *capillis* I take to be certainly right. But *capillis* was probably in the archetype, the *ca-*, almost indistinguishable from *ta-*, causing the loss of *ta* at the end of the participle. What was that participle? Certainly not *armata*. Perhaps we should read :

Inter quos Helene nudis TARDATA papillis
Fertur nec fratres erubuisse deos.

Helen may be described as retarded in her martial exercises by *papillae* when unconfined by the *strophium*. If this conjecture should meet with acceptance, it will be something in favour of Scaliger's *tarda* for *et arma*, I. iii. 16.

III. xv. 3.

Here I will appeal to Baehrens himself.

Ut mihi praetexti pudor est sublatus amictus.

So Baehrens reads, probably rightly. But if he be asked where he gets the reading *praetexti*, he must confess that he gets it from N. O gives the obvious correction *praetexta*. It is to be noticed that N's testimony is here peculiarly valuable, as its reading is totally destitute of meaning, owing to its giving *amicus* for *amictus*—an almost certain slip for the copyist who wrote N, if indeed he did not find *amicus* in the archetype. Yet, though Baehrens reads *praetexti* from N, he does not place N on an equal footing with O, and does not allow it a primary share in the reconstruction of the archetype.

The meaning of the above verse is: 'Ever since the bashfulness which my boyish bordered robe carried with it was removed' (by the assumption of the plain toga virilis.)

III. xv. 34.

Ac veluti, magnos cum ponunt aequora motus,
Eurus sub adverso desinit ire Noto.

So N. *In adversos*—*Notos*, O, which is certainly wrong, *ubi* Lachmann for *sub*, which I read. But *et* is probably right. The compendia for *sub* and *sed* were not unlike; and *et* with *s* preceding = *set*, *sed*.

III. xxi. 19, *seqq.*

Deinde per Ionium vectus, cum fessa Lechaeo
 Sedarit placida vela phaselus aqua,
 Quod superest sufferre, pedes properare laborem,
 Isthmos qua terris arcet utrumque mare.

Sufferre has here been wrongly altered by all editors to *sufferre*, taking *pedes* as the vocative plural of *pes*. It is, as I have shown, the nom. sing. of *pedes*, *peditis*; and *laborem* is a verb, not the accusative of *labor*. *Laboro*, however, should be read, the change to *laborem* having been caused by the aforesaid mistake. Now, both Baehrens and Hertzberg say that *properare* is in N. If so, it would be a valuable testimony in favour of that MS. But it is not so. I was particularly anxious to find that N had *properare*, as I had already arrived at my theory of the passage, and was much disappointed at finding *properate*, which must, however, be changed to *properare*: *r* and *t* are repeatedly confused. *Vectus*, properly used of the passenger, not of the boat, demands my view. Hertzberg probably found *properare* in some other MS., and wrongly attributed it to N.

IV. iv. 29, 30.

Et sua Tarpeia residens ita flevit ab arce
 Vulnera, vicino non patienda Iovi.

Non patienda N, 'not to be tolerated by neighbouring Jupiter,' rightly: *compatienda* O, 'deserving of being compassionate by'; dog Latin, a mediaeval interpolation, on which Baehrens builds his emendation *comperienda*.

I should prefer to read *Et Tarpeia sua* in the first line: cf. iv. 4. 32.

IV. iv. 55, 56.

Sic, hospes, pariamne tua regina sub aula ?
 Dos tibi non humilis prodita Roma venit.

So N, uniquely, simply, and perfectly rightly. I put the question stop at the end of the verse, and this reading is, I hold, the only one that gives sense to the passage. Tarpeia, that immodest traitress, says: 'Shall I, for these services (*sic*), become your queen and the mother of your children? The betrayal of Rome is no mean dower.'

The lover of criticism will find matter to repay him in carrying on the investigation into all the more minute discrepancies between N and O. It is, however, beyond the limits of my present leisure. I may state, however, that I have carefully examined all the points of divergence, and that I can come to no other conclusion than these:—

(1) That N is the best of the Propertian codices, though occasionally interpolated, but generally only when the archetype was mutilated or defective.

(2) That the consensus of O is extremely valuable, though exhibiting much greater interpolation than N.

(3) That the AF family is much more honest than the DV family. I should like to devote a few pages to show the truth of the latter conclusion; but I must content myself with observing, that it is so evident that it does not demand more than the placing in juxtaposition the divergent readings of the two families.

It is true that from DV one or two good readings are derivable, such as *omnes Heroidas inter*, ii. 18. 28: *Ut te*, i. 8. 19. But these are not absolutely certain; and even if they were certain, no one could deny that they may be corrections. This cannot be said of *attractus* in ii. 1. 31; or of *a porco* in iv. 10. 18, in the FN family, where the true reading is indicated through a corruption. There

is nothing of the sort in the DV family. *I challenge Baehrens to produce a single instance in the DV family where the true reading is preserved against the other family through an unintelligible corruption.* He should be able to do this before he can say, as he does in his preface, that both families are of equal value.

Baehrens' theory is, in fact, false generally, and false in detail. He has assailed the position of N, but only to render it more secure. He has asserted the merits of D and V, which are interpolated to a very considerable degree. But although success has not crowned his daring efforts, he has rendered great services to the future editor of Propertius. That editor is yet to be found, and the text of Propertius will never be thoroughly settled until some painstaking scholar is found, who will be content to devote some of the best years of his life to collating all known MSS. of this author, and publishing an edition on the scale of Ellis's edition of Catullus, on which all future editions shall be founded.

I am not now reviewing Baehrens' Propertius, or I should have something to say of the vast number of new emendations he has introduced. I shall simply content myself with recording those new emendations which appear to me worthy of adoption. I have independently hit on the same emendation as he has in ii. 1. 31, *atratus* for *attractus*; iii. 8. 27, *cui* or *quoi* for *quae* or *quum*, iv. 1. 49; *cavom* for *cavo*.

In ii. 1. 67,

Dolia virgineis idem ille repleverit urnis,

Baehrens reads *umbris* for *urnis*, which is good.

In ii. 3. 22,

Carmina quae quivis non putat aequa suis,

he reads Carminaque *a vivis*, which is very plausible.

In ii. 15. 25,

Atque utinam haerentes sic nos vincire catena
Vellet uti numquam solveret ulla dies.

This is Baehrens' reading for *Velles ut*, F giving *Vellet*. The emendation is excellent, and very likely right. The attributing volition to a chain makes it just stop short of certainty.

II. xxii. 39.

Aut si forte irata *deo* sit facta *sinistro*.

For *meo—ministro*. This is good; at any rate it gives some meaning to a very obscure passage, with trifling change.

III. v. 44.

Tityo iugera *operta* novem, for *pauca*. Very possible.

III. ix. 36.

Tuta *sed* exiguo flumine nostra mora est,
for *sub*. Rightly, I think.

III. ix. 16.

Vicit victorem candida *virgo* virum,
for *forma*.

III. xiii. 9.

Haec etiam clausas expugnant arma *maritas*,
for *pudicas*.

III. xiii. 37.

Pinus et incumbens *lentis* circumdabat umbras,
for *lentas*.

III. xvi. 15.

Luna *inlustrat* iter, for *ministrat*. The words are almost identical, *in* being often confounded with *m*, *i* with *l*, and *u* with *i*.

IV. iv. 52.

Hanc quoque formoso lingua tulisset opem,
for *haec*.

IV. vi. 60.

At pater Idalio miratur Caesar ab astro :
Tu meus, et nostri sanguinis ista fides.

This I consider is Baehrens' best emendation in Propertius, and one which may well make the reader exclaim,
O si sic omnia!

There is a very clever one also in

IV. vii. 78.

Et quoscumque mihi fecisti nomine versus,
Ure : mihi laudes *me sine* habere meas,

for the vulgate and MS.

Ure mihi : laudes desine habere meas.

It is, however, unnecessary. For no one can deny that the vulgate is Latin, and contains a good and pathetic sense.

Since the publication of my text of Propertius, the following new emendations have occurred to myself:—

II. viii. 30.

Ille etiam abrepta desertus coniuge Achilles
Cessare *intactus* pertulit arma sua,

for *in tectis*. Achilles laid his armour by *and did not put it on*. This seems to me a very simple and certain emendation: *u* and *i* are often confounded in Propertian MSS. So *aspersus* should probably be read *i*. 12. 16, for *aspersis*:

Nonnihil *aspersus* gaudet Amor lacrimis.

I. iv. 13, 14.

Ingenuus color et multis decus artibus et quae
Gaudia sub tacita dicere veste libet.

In the second very obscure line, where *ducere* has been proposed for *dicere*, and *nocte* or *mente* for *veste*, I now propose keeping *dicere*:

Gaudia *sed* Tacita dicere *teste* libet.

‘Joys one would like to speak of, but with the goddess of silence as a witness.’ Tacita is mentioned by Ovid, Fast. ii. 572. I also take this opportunity of retracting a few emendations which on mature consideration appear indefensible. In i. 9. 13, I should have stood by *compone*: I had not noticed what I notice now, that Ovid uses this verb of the arranging, putting by, of books on a shelf.—Pont. i. 1. 11.

In iii. 5. 6, I withdraw my *misera*: I will not be angry with Baehrens if he calls it a miserable emendation. *Mira* would be better, agreeing with *aera*. But *miser* is defensible.

In iii. 3. 21, I withdraw *devecta* and adopt '*praescriptos evecta est pagina gyros*' of Scaliger and Lipsius.

IV. xi. 30.

Scaliger's reading, *Afra—regna* I now consider certain, and I must condemn myself for excessive audacity in attempting to improve on it.

My reading of *comminus* in i. 1. 12 is, I think, almost established by Ovid, *Fast.* v. 176—

Audet et hirsutas comminus ire feras—

a passage which I did not notice until I had made the conjecture.

My conjecture, *ferae*, in iv. 6. 36, may at first sight appear at variance with *imbelles*; but it is not so really. Propertius himself includes *lepores molles* among *ferae*, and contrasts them with lions and wild boars, ii. 19. 19.

Incipiam captare *feras*, et reddere pinu
Cornua et audaces ipse monere canes,
Non tamen ut vastos ausim temptare leones
Aut celer agrestes comminus ire sues,
Haec igitur mihi sit *lepores* audacia *molles*
Excipere et stricto figere avem calamo.

In this passage Baehrens strangely suggests *incipi-amque aptare feros* (= *equos*!!), and says of *cornua* that he takes it to mean a bow. Surely the practice of fastening the horns of deer and spoils of the chase to pine trees is sufficiently established by Euripides—*Bacchae* 742 :

κρεμαστὰ δὲ
ἔσταλ' ὑπ' ἐλάταις ἀναπεφυρμέν' αἵματι.

But, as Haupt says, 'De Propertio dicere infinitum est.'

A. PALMER.

‘CELTICA.’

IN his edition of *Three Middle-Irish Homilies on the Lives of SS. Patrick, Brigit, and Columba*, Dr. W. Stokes has laid himself open to the criticism which asks, ‘If these errors are committed in plain and simple prose, how will it fare with the difficulties of Irish poetry?’ I do not refer to the bardic whimsicalities by which the word *fer*, for example, is regarded as becoming *feron*, or *feer*, or *ref*, or *ser*, or *fel*, or *fefrier*, or *fertot*, &c., by ‘formolad,’ &c., for Irish poetry is quite sufficiently difficult to deal with outside of these affectations. But if guess-work in the case of unknown words and constructions, or imperfect handling of common constructions and phraseology, be manifested in editions of ordinary prose, even by scholars like Stokes, students will feel justified in observing the more caution in admitting the soundness of speculations in reference to possibilities of construction in Irish poetry.

The following examples, taken from the *Lives*, as edited by Dr. Stokes, will show that caution is by no means unnecessary. There are, of course, many other things throughout the whole edition to which more or less exception might be taken; but I shall only quote here five passages, to the correction of every one of which, I think, Dr. Stokes will assent:—

I.

On p. 29 of the translation will be found the following lines: ‘But Coirpre opposed him, . . . and Patrick said that

his children would serve his brother's children for ever; and that neither kings, nor bishops, nor wise men should spring from him, and that his land would be small, and the issue was so.' Nobody's prophetic credit is here at stake, so that the declaration or non-declaration of the fulfilment is immaterial. At all events, the original text is quite silent on the subject. The last words have a familiar quasi-Biblical ring, '*and the issue was so*'; but I cannot recall any translation perpetrated in the West that more distinctly overleaps grammatical rules and falls on the other side. The Irish original is as follows, according to Stokes:—'*ropad becc a fferond, oculus ropad essith amlaid*,' which is thus rendered by him: 'his land *would be* small, and the issue *was so*.' Here the first *ropad* is rendered *would be*, and the second *was*. But *ropad* does not mean *was*; it means *would be*, as is admitted surely by everybody. In the second place we turn to the glossary, and find the entry '*essith* = issue, borrowed from *exitus*.' I cannot imagine how the editor conceived that possible. Perhaps he was misled by the quotation in the *Gram. Celt.*, p. 49, where, as an example of an Irish *ss* derived from a Latin *x*, are given the words *anestid*, gl. *exitum*, and *doesstd*, gl. *exitio*. These examples are not to be found in the first edition of Zeuss's Grammar, and I believe they would have been scouted by Zeuss as impossibilities *in this connexion*, viz., 'in latinis vocibus transumptis,' as Ebel puts it. No doubt *essith*, prima facie, does look like *exitus*; but, how about the long *i*? In the third place, the contraction¹ *am̄* (*L. Breac*, 27 β 60) is

¹ On p. 96 occurs a Latin verse which Dr. Stokes has edited as follows: 'ad-vena sum apud te, domine, et peregrinus sicut omnes *per mundum*.' One would think that the abbreviation *p. m.* in this familiar passage might have been

more satisfactorily explained, especially as the Irish original follows it up by the commentary 'after the likeness of the *foregoing elders*,' which should have suggested the correct reading, viz., *patres mei*, not *per mundum*.

not usually read *amlaid*, but *amail*, and this gives the proper explanation to the whole passage, which should have been as follows:—

ropad becc a fíerond ocus ropad essíthamail.
‘that his land *would be* small, and *would be un-peace-ful*,’

amail being simply the common adj. termination to *es-sth*, *non-peace* (the *exitium*, not *exitus*, of the Zeuss gloss), from the Irish word *sth*, peace.

II.

Page 34 :—

rucc gilla Dáre aech maith isinreclas
dóchum indféoir díguind.

‘Daire’s gillie brought his good horse
into the close to the grassplot’ (?)

This is a mere tentative translation, as the (?) shows; but one does not see on what grounds it is made. It makes tolerable sense, certainly, but that is just the danger in translating, viz., that we should make *some* sense, which is not *the* sense, and so be guilty of the blunders for which Dr. Stokes has often and justly vituperated Irish translators.¹ There seems no ground for boggling here, however; for even O’Reilly’s Dictionary

¹ What curious things can be done by translators may be illustrated by the following line, taken out of *The Poets and Poetry of Munster*, 2nd series, p. 82 :—

U’olpádo an porter ’r mór éuro
ve’n lúin,

where the poet is speaking of two

common-place liquids *porter* and *ale*; but the translator has absolutely rendered the line as follows :—

‘O, the *porter* itself soon in drink would go round.’

Appended is a note, explaining that this is the ‘*Four-poster*,’ the state bed of every farm-house.

gives the solution : *diguind* is just the genitive of *ṽioḡann*, i. e. *di-gann* ; or, as the O'Clery glossary explains it, *neam-ḡann*, and means *plentiful*. 'The grass had grown abundantly, and the gillie took the horse to the *abundant grass*' : cf. *F. Mast.*, sub anno 1592 [vol. iii. p. 1920], *Δο δῖδο ὁοιρε ὁοῖαδ ὁιοḡανν ῖοῖ Δ ḡιονν*, 'they observed a *dense* bushy grove before them.'

III.

Page 58:—

roalt tra innóebingensa ochomairbirt
bith ocus samail friacombessaib ar-
chena.

'now this holy virgin was nourished
with food, and like to her compeers (?)
besides [or, as he prefers in the 'Correc-
tions,' 'like to those of her age'].

His glossary (p. 133) gives this entry—

'comairbert bith, s.f. *food*.'

This is incorrect, for the examples in Zeuss, *Gram. Celt.*, p. 918, show indeed that *airbert biuth* has that meaning, but not the compound *comairbert biuth*, which means *custom* ; e. gr.—

echtar comairbirt mbiuth pecthae
(extra consuetudinem peccatorum) ;

and the passage should have been rendered, 'she was nourished *after the fashion of, and like to, the others*.'

IV.

Page 2 :—

ise *leth atáibe* indaisneisea lasinfkith
codú indepert remi isinsceol cétna.

‘now the prophet has a *parallel passage* as far as the place where previously in the same story he said,’ &c.

Page 50 :—

ise *leth atáibe* inaisnéis laheoin codu
indepert remi inashoscéla.

‘now this is the *parallel part* of the declaration by John, as far as where he previously said in his gospel,’ &c.

As the translation here given is not very lucid, we refer to the brief glossary accompanying his edition, sub *leth*, and obtain this information: ‘*leth a-tóibe*, lit. *half of its side*, seems to mean “parallel passage.”’ The phrase is so familiar in this connexion, that I am quite at a loss to understand how the Editor could be content with the explanation he has given. It will be admitted that there is room for another attempt at explanation. It will be well, therefore, to quote some instances of its occurrence throughout the *L. Breac* :—

- 40 β 23. coibnes na liachtan-sa ise *leth is aentadach*
fri Matha codú indepert remi, &c.
- 44 α 16. coibnius inna h-aisneissen-sa ise *leath atóibe*
[gl. ιϛ αενταδοαδ] fri h-Isu, &c.
- 45 α 54. coibnes na liachtan-sa ise *leth is aentudach*
fri Matha, &c.
- 59 α 29. ise *leth is aentadach* ind aisnes
codú indepert remi, &c.
- 61 β 29. ise *leth atóibe* in aisnes la h-Eoin codu inde-
pert remi, &c.

- 66 β 16. coibnius na cobige-sea ise *leth atáibe* la Matha
codú inerbairt ria sund, &c.
- 72 α 17. coibnes na h-aisen-sa ise *leth atáibe* la Daniel
codu indepait remi, &c.
- 194 α 31. coibnes na liachtan-so ise *leath atóibe* [gl. ΔΓ
ϕλνιτ] codú inerbairt Eóin, &c.
- 248 α 66. ise *leth atáibe* la Ihesu codú, &c.

Or, again—

- 107 α 28. coibnius, &c., *isl cdi hitóibe*, &c.

This last quotation should make it perfectly clear that *atáibe* is not *a-toíbe*, 'of its side,' which could not be *hitóibe*, most certainly. Now, the phrase that commonly alternates with *atáibe*, as will be seen, is '*is aentadach*,' and that means 'harmonizes with,' as in fact it is used in translating 'concordat,' in 53 α 48, so that there is no doubt of the function of the word *atáibe*, viz., a verb meaning *concordat*. A verb *atáibim*, *attoibim* occurs in the *Gram. Celt.* p. 435 [*recte* 436, as this page is misplaced], l. 14, in both places as a gloss on *lenteo*, whatever that may mean.

V.

Grammatically, I do not see why Dr. Stokes edits the clause of the doxology as follows: 'in oentaíd nanoem trínóti . . . , *athair 7 mac 7 spirut nóeb*,' as he does on both p. 46 and p. 124; which is in fact to edit 'in unitate sanctæ trinitatis, pater et filius et spiritus sanctus.' It is written in full, *L. Breac*, 66 α 60, *athar 7 mic 7 spirat noib*; cf. also 55 β 63, *athar*; 45 α 4, *s̄p̄a*; 43 β y, *s̄p̄a*; 52 β 8 *s̄p̄a*; 48 β 15, *s̄p̄ita nóib*.

ROBERT ATKINSON.

Before this sheet has gone to press, I have received a copy of Dr. Windisch's carefully and conscientiously edited *Irische Texte*, with its excellent glossary, in which he has digested a considerable portion of the best knowledge as yet attainable. This glossary is a right welcome addition to our resources, though one might have wished a little more boldness in dealing with some of the speculations of our native translators.

One instance must here suffice: *ex. gr.*, sub *tuinset*, he quotes without remark, ‘Cf. *tuinnsiomh*, a *sound*, *noise*.—O’R.’ Now O’Reilly certainly gives this meaning, adding a quotation from the *F. Mast.*, sub ann. 1504, where apparently, O’Donovan also agrees in his rendering *tuinn-piom na ttrienfeap acca ttriarccrao*, ‘the sound made by the falling of the brave men.’ But a passage from the *L. Breac* throws a different light on the word:—

L. B. 46 β 10. *tuinsema* din in leoman 7 in dracoin,
 „ β 8. *conculcabis* leonem et draconem.

Cf. also β 4, ‘de sui vero conculcatione quasi tergiversator tacet’; or, as the Irish has it, ‘celid imorro diabul in fers a-fil a *thuinsem* fen amal feichem nguach’; and again, ‘uair is do-follsiugad in *tuinnsim*-sin doberat na dóine forphti,’ &c. It is evident, therefore, that *tuinnsiomh* means *trampling under foot* in the passage in the *F. Mast.*, and not *noise*, *sound*, as given by O’Reilly, &c. It then came to mean any *violent blow* or *thrust*: cf. *F. Mast.* iii. p. 2214, and so was applied to the *explosion* of gun-powder: v.gr. *F. Mast.* vol. iii. p. 2012. But it never means simply *noise*, *sound*.

R. A.

NOTE ON *BREHON LAWS*, VOL. IV. P. 382.

A CURIOUS instance is to be found in the last volume (just published) of the *Brehon Law Tracts* (vol. iv.) of the impossibility of placing any confidence in the accuracy of comparatively late transcriptions of older Irish poetry. On p. 382 occurs this verse :—

mac in abaro ip in cill ginn	The son of the abbot in the pleasant church
tni cunne pop ciall	A fact established by sense,
mac in tpebt ip in tuait	The son of the husbandman in the territory,
mac in pi do maom na nciall.	The son of the king to bind the hostages.

On the verse the editor has the following remarks in his Introduction, p. ccxxiv: ‘Other extracts prove that among the Celts, as elsewhere, the claim to the hereditary transmission of property and office was gradually assuming a legal form :—

“The son of an abbot in the present [*sic*] church,

“*A fact established by sense,*

“The son of the husbandman in the territory,

“The son of the king to bind the hostages.”

This is obviously a verse of some composition intended to favour the hereditary succession to the coarbships of the greater monasteries, and even to inferior but profitable offices.’

I am not concerned here to discuss the validity of the inference, but to show that the translation of the second

line (italicised by the Editor) is wrong. Of course not the slightest blame attaches to the editor for this, for the text itself is quite distorted, so that metre, rhyme, and sense are ruined. All is set right by a reference to the verse in a sounder form, viz., in the *Book of Leinster* [148 a 1], where we have

mac in[t]abbad iss-in cill
is-e grind gonas mo chfall
mac in trebthaig iss-in tfr
mac ind-rfg do naidm na-ngiall.

‘*This is what pleasantly wounds (strikes) my sense,* the son of the abbot in the church,’ &c. Here the two emphatic words of the preceding translation, both no doubt eminently satisfactory to the legal mind, viz., *fact* and *established*, have no existence whatever.

ROBERT ATKINSON.

NOTES.

I.—EURIPIDES, HIPPI., vv. 372–86.

THE poet proposes to discuss (in the person of Phædra) what are the causes of failure in human life. He proceeds:—

377 καί μοι δοκοῦσιν οὐ κατὰ γνώμης φύσιν
 πράσσειν κάκιον· ἔστι γὰρ τό γ' εὖ φρονεῖν
 πολλοῖσιν· ἀλλὰ τῇδ' ἀβρητέον τόδε·
 τὰ χρῆστ' ἐπιστάμεσθα καὶ γινώσκωμεν,
 οὐκ ἐκπονοῦμεν δ', οἱ μὲν ἀργίας ὕπο,
 οἱ δ' ἡδονὴν προθέντες ἀντὶ τοῦ καλοῦ
 ἄλλην τιν'. εἰσὶ δ' ἡδοναὶ πολλαὶ βίου
 μακραί τε λésχαι καὶ σχολή, τερπνὸν κακόν,
 αἰδώς τε. δισσαὶ δ' εἰσὶν, ἡ μὲν οὐ κακή
 ἡ δ' ἀχθος οἴκων. εἰ δ' ὁ καιρὸς ἦν σαφής,
 οὐκ ἂν δὴ ἤστην ταῦτ' ἔχοντε γράμματα.

I see that the newest editor, Berthold, feels, with Gomperz, that there is great difficulty in the passage, and reads (too boldly):

383 ἄλλην τιν' ἄλλος. εἰσὶ δὲ φθοραὶ βίου

But the objections are so obvious, that I wonder they have not long since struck critics. I will not pause over the repetition of κακόν, κακή at the end of successive lines, which is not like Euripides' writing, but rather at the absurd description of pleasure. Men are deceived by some pleasure (ἡδονή), and thus blinded to the right course. But how are the wild passions of life, that do

this mischief, specified?—by *μακραὶ λίσχαι*, by *σχολή*, and then by the sudden appendix of *αἰδώς*! And even this appended *αἰδώς* is not a clear case, for only some kinds of it are hurtful.

Was there ever a plain argument so hopelessly muddled? For here is what the poet, who thinks and writes clearly, must have intended: ‘Why do we *fail* in this life? Is it from ignorance, or from moral weakness?’ To this question the greatest moral teacher of the day, Socrates, was giving in his daily conversation the former answer. He said that all vice was ignorance, and that what we required was to have our moral notions cleared and refined by proper discussion. It is with this now fashionable theory, preached with all Socrates’ power, that Euripides takes issue. He says it is not a question of knowledge: we may be as clever as we like, and discuss right and wrong at full length; but there is another element, that of *passion*, which comes in and disturbs our reckoning. This passion or pleasure (*ἡδονή*) is often harmless, and may be indulged; but in other cases it is the guide to ruin. I believe Euripides expressed all this clearly, so far as we have his text, in the following way:—

377 καὶ μοι δοκοῦσιν οὐ κατὰ γνώμης φύσιν
πράσσειν κάκιον· ἔστι γὰρ τό γ’ εὖ φρονεῖν

384 μακραὶ τε λίσχαι καὶ σχολή, τερπνὸν κακόν,
πολλοῖσιν· ἀλλὰ τῇδ’ ἀβηρτέον τόδε·
τὰ χρῆστ’ ἐπιστάμεσθα καὶ γινώσκομεν
οὐκ ἐκπονοῦμεν δ’, οἱ μὲν ἀργίας ὕπο,
οἱ δ’ ἡδονὴν προθέντες ἀντὶ τοῦ καλοῦ
ἄλλην τιν’. εἰσὶ δ’ ἡδοναὶ πολλαὶ βίου

[gl. *αἰδώς* τε] . . . δισσαὶ δ’ εἰσὶν, ἡ μὲν οὐ κακή
ἡ δ’ ἄχθος οἴκων, κ.τ.λ.

If this order of the lines be right, we have a direct criticism not only of the theory but of the practice of

the Socratic School, who spent their days in long talks, and in a philosophical leisure, which often degenerated into idleness. 'Many have plenty of sense, and talk plenty about it, and waste their time; but this is the way to look at it: We know right and wrong well enough, but fail to carry out our theories—some from laziness, and some from passion, which mislead us. There are many particular passions, but they may really be classed under two heads—lawful and unlawful pleasures,' &c. A word fell out at the beginning of v. 384, which we can hardly replace by conjecture; for some stupid scholiast, remembering a parallel passage in Hesiod on αἰδώς, wrote αἰδώς τε in the margin, and this has been the substitute for a lost word with no similar sense, and probably no other likeness to it, which may have belonged to either the previous or subsequent clause. It is also possible that a line has disappeared before the missing word, and has been replaced by the line transferred from its proper place. But this is not at all necessary to the proper interpretation—or the balance of the sentence—if the missing word were rediscovered.

I will add, that Weil's change of πράσσειν κάκιον into πρ. τὰ χείρον' is unnecessary. πρ. κάκιον is here taken in its usual sense of faring ill, or failing in life (v. 376, ὃ διέφθαρται βίος).

II.—A FURTHER NOTE ON THE INTERPRETATION OF PLATO, *Apol.* 26 E., πριαμένους ἐξ ὀρχήστρας, &c.

Since the last number of HERMATHENA, with my new interpretation of the passage, was published, Mr. George Macmillan has called my attention to the fact that the word ὀρχήστρα never occurs in Aristophanes. I followed

up the suggestion through the fragments of the other comic poets, and find that in Jacobs' trustworthy index to Meineke's collection there is but a single such reference, and that (from an unnamed poet) such as to strengthen my view, that the use of *ὀρχήστρα* for any part of the theatre is not an early use, because that term was applied to the platform beside the *ἀγορά*. Here it is :

Photius, voc. *ὀρχήστρα*. πρῶτον ἐκλήθη ἐν τῇ ἀγορᾷ
εἶτα καὶ τοῦ θεάτρον τὸ κάτω ἡμικύκλιον, οὗ
καὶ οἱ χοροὶ ἦδον καὶ ὠρχοῦντο. εἰς τὴν ὀρχήστραν,
ἔτι γὰρ τὴν θέαν ᾤκειτ' ἐκεῖ, φησὶν ὁ κωμικός·

ὁ κωμικός probably means Aristophanes. If the centre of the theatre had been then called orchestra, the remark could hardly have been made in this form.

The earliest occurrence of it in the new sense appears to be in Andocides' *de Mysteriis*, § 38, in a description where the sense limits it to the theatre; then the Speech *on the Peace* (p. 175 c) of Isocrates, not therefore before 356 B.C., and here too defined by the context; and we often find it spoken of even later (by Demosthenes and Æschines) as ἐν τῇ Διονύσου ὀρχήστρᾳ, as if to distinguish it from the older *ὀρχήστρα*.

These facts will serve to correct the account of the word in Liddell and Scott's meritorious *Lexicon*, and will add some weight to the arguments already advanced in the interpretation of the passage in the *Apology*.

III.—HERODOTUS, I. 72, and II. 34.

In Mr. Bunbury's recent *History of Ancient Geography*, vol. I., p. 233, Herodotus has been charged with extraordinary ignorance in his estimate of the distance across

Asia Minor at its narrowest point, from the Gulf of Alexandretta to the Black Sea. If he indeed did not know, even approximately, a distance which was perfectly well known to traders, and very often travelled, how can we trust him in more remote regions? For his text says that an active man can go *in five days* from sea to sea. The actual distance, when estimated by the usual conditions of such journeys (about twenty miles a-day), would require fifteen days. I do not believe that Herodotus made such a blunder, but that the mistake lies in a slight corruption of the text. I append the ordinary reading and that which I support, which will, I think, commend itself to most critics:—

μηκος ὁδοῦ εὐζώνῳ ΑΝΔΡΙΕΗΜΕΡΑΙ ἀναισιμοῦνται

ΑΝΔΡΙΕΗΜΕΡΑΙ sc. 15 days, the second
I having dropped out.

Curiously enough, there is in II. 34, the very same statement to be corrected in the same way, πόντῳ coming before the πέντε, viz:—

ἐντεῦθεν ἐς Σινώπην τὴν ἐν τῷ Εὐξείνῳ

ΠΟΝΤΩΙΕΗΜΕΡΕΩΝ

ΠΟΝΤΩΙΕΗΜΕΡΕΩΝ ἰθὺς ὁδὸς εὐζώνῳ ἀνδρί.

IV.—WHEN WAS THE γραφή παρανόμων AGAINST INDIVIDUALS INSTITUTED?

It is an interesting question, in the case of most of the peculiar laws of Athens, to determine when they came into force. The old Greek orators, and even Aristotle, probably on their authority, ascribe the whole developed

democratic constitution to Solon, as if any great constitution of this kind was created in a day! Grote, who understood politics, was perhaps the first historian of Greece who saw clearly the gradual growth of the democracy, and strove, generally from internal evidence, to fix the steps in this gradual change.

It is very disappointing to find how little effect his truly philosophical views have had upon German philologists. They accept scraps of untrustworthy evidence as of more import than the reason of things, and Schömann in particular, in a special polemical tract, and in his *Antiquities of Greece* (both translated into English), sets forth doctrines about Solon, which can hardly be called anything short of absurd. Anyone who believes that ostracism, and the *γραφὴ παρανόμων*, were the inventions of Solon about 600 B.C., does not deserve to be refuted. Grote in fact showed clearly that the Law of Ostracism was a new and improved way of meeting a political crisis, which replaced Solon's ruder expedient of punishing neutrality. If there be an actual insurrection, said Solon, you must take up arms on either side. If there be an insurrection pending, said Cleisthenes (or some one about his time), get rid of one of the leaders, and obviate the insurrection.

There can be no reasonable doubt that the *γραφὴ παρανόμων*, in its wider application, was a measure of the same kind, and devised to interfere at an earlier stage of the danger. Long before a political leader became powerful, or violent enough to require ostracism, he could be stopped by an impeachment for illegal procedure.

When did this third development of the political safety valve come into use? Schömann, in his usual random style, sees no reason why we should not believe the tradition that Solon devised it. Grote thinks (v. 507) it dates from the time of Pericles. I can find no opinion expressed by E. Curtius. It seems to me to date much

later; and though it may have long existed in the special form of an action against direct verbal contradictions of particular laws by new enactments, I think it certain that its importance dates only from the disuse of ostracism (417 B.C.), and was even a direct consequence of this disuse. For I cannot find any mention of it as long as ostracism prevailed; whereas immediately after that period notices become frequent. The earliest appear to be (1) a speech of Antiphon's, defending Demosthenes (probably the general), against such a charge, and if so, before 415 B.C.; but, so far as we can guess, after 423 B.C., when the general's popularity became great. (2). A legal case mentioned by Andocides, as one in which his father was concerned, and one which may be fixed about 416 B.C. It is, moreover, of the last importance to observe that *he speaks of 6000 dicasts as deciding it.*¹ (3). The account of Thucydides (viii. 67) of the proceedings of the 400 (411 B.C.): *ἦν δέ τις τὸν εἰπόντα ἢ γράφεται παρανόμων, κ. τ. λ. μεγάλας ζημίας ἐπέθεσαν.* At this time, then, the procedure by a lawsuit existed. Why do we never hear of it so long as ostracism lasted? There was surely ample opportunity for it during the days of Pericles, or still more of Themistocles. Ostracism is constantly mentioned, never the *γραφή*. In the old and middle comedy it does not appear to be mentioned before Antiphanes (Sappho, *Fr.* 1).

If ostracism was *replaced* by it, this earlier silence is at once explained. Perhaps some evidence has been overlooked in the above argument; if so, I shall be thankful to any scholar who will point it out. But until such evidence is produced, the balance of probability seems to be strongly in favour of the view suggested by the 'reason of the thing.'

¹ ἐγράφατο τὸν Σ. παρανόμων, καὶ (de Myst. § 17).
ἠγωνίσσατο ἐν ἐξακισχίλοις Ἀθηναίων

V.—THUCYDIDES II. 41.

καὶ μόνη οὔτε τῷ πολεμίῳ ἐπέλθοντι ἀγανάκτησιν
ἔχει ὑφ' οἷων κακοπαθεῖ, κ. τ. λ.

Most editors have felt so great a difficulty in the word κακοπαθεῖ being applied to an *invader*, that they have emended the passage, and changed ἐπέλθοντι into ἐπελθοῦσα, or, with Badham, into πάθοντι, which Cobet (in the latest number of *Mnemosyne*) proposes to retain, and reject τῷ πολεμίῳ as a gloss.

I cannot but feel the impropriety of the expression in the text, with these scholars, and will not defend it, but confess to some hesitation from the comparison of a passage in Diodorus, which has not been cited in the discussion. He is talking of Epaminondas' attack upon Corinth, and his repulse by Chabrias (xv. 69), οἱ δὲ Βολιώται, πολλὰ μὲν κακοπαθήσαντες, οὐδὲν δὲ πρᾶξι δυνάμενοι, τὴν ἀναχώρησιν ἐποίησαντο.

So then Diodorus, at all events, felt no difficulty in applying the word as it is applied in our text.

VI.—EURIPIDES, HIPPOLYTUS, 293-4.

κεῖ μὲν νοσεῖς τι τῶν ἀπορρήτων κακῶν,
γυναικες αἶδε συγκαθιστάναί νόσον.

How can this verb, συγκαθιστάναί, possibly mean *to help in allaying*? It would rather mean *to help in establishing*. The usage is quoted by Stephanus as unique in this passage, and is not defensible even by the medical uses of καθίσταναί in Hippocrates. This difficulty, together with the occurrence of νόσεῖς in the previous line, convinces me that the phrase is corrupt.

J. P. MAHAFFY.

THE ELEUSINIAN INSCRIPTION OF 446 B.C.

I.

THE inscription discovered at Eleusis, at the end of 1879, throws light upon two Greek words. Before, however, discussing these, a short account of the Inscription itself may not be uninteresting to the readers of HERMATHENA. Inscribed on Pentelic marble, it was found near the temple of S. Zacharias, at Eleusis, and first published in an Athenian journal, *Παλιγγενεσία*, in February, 1880. Since then, M. Foucart and H. Sauppe have edited and annotated it. Both the forms of some of the letters, and also a fact in its contents, prove that its date is 446 B.C. It is an Athenian decree, devoting certain portions of the produce of the land as first-fruits to Demeter and Persephone, and directing the Demarchoi to collect the dues, each in his deme, and bring them to be deposited in the temple of those goddesses at Eleusis: the allies were also to be obliged to contribute. But what perhaps is the most interesting point in the whole document is the sentence directing that the city should announce this decree 'to all the other (*i.e.* except the allied) Grecian cities, *to which it may seem to be possible—*'urging, but not commanding' them, to contribute offerings, 'if they wish.' This exclusion seems to point at Sparta and Thebes. I may notice the words *μη ἐπιτάττοντας, κελεύοντας δέ* as a remarkable example of the proper meaning of *κελεύειν*. The rest of the decree is occupied with details of sacrificing and dedicating, but a few lines from the end is the direction that in future it

should be unlawful to erect altars in the *Pelargicon* without the authority of the Boule and Demos, or to cut and take away the stones from that sacred place, or bring earth or stones into it—with a penalty of fifty drachmae: this resolution is evidently due to the oracle of which Thukydides records (ii. 17) the ἀκροτελεύτιον. The foregoing part of that oracle was what induced the Athenians to offer these first-fruits—κατὰ τὰ πάτρια καὶ τὴν μαντείαν τὴν ἐν Δελφῶν. One important point which I can barely mention still remains, ‘Μῆνα δὲ ἐμβάλλειν Ἑκατομβαιῶνα τὸν νέον ἄρχοντα,’ which shows that Poseideon was not the only month that was repeated by intercalation. I now proceed to the consideration of the words on which the inscription throws light.

II.—ON THE WORD σιρός.

Σιρός (we also find the spellings σειρός and σιρρός in the codices) is explained by Liddell and Scott as ‘a pit, especially for keeping corn in,’ and it is generally held to be the name of the underground caves in which the *Thracians* kept their corn; and, to judge from the extant passages, which bear on the word, the σιροί seem to have been confined to Thrace, and the word used only to designate the Thracian pits. Demosth., Περὶ τῶν ἐν Χερρ. 100, 26, says, ὑπὲρ δὲ τῶν μελινῶν καὶ τῶν ὀλυρῶν τῶν ἐν τοῖς Θρακίοις σιροῖς ἐν τῇ βαράθρῳ χειμάζειν. The Emperor Julian has in a letter πῶς μὲν καλῶς ἔχει ἡμᾶς μὲν ἐν Θράκῃ διάγειν καὶ τοῖς ἐνταῦθα σιροῖς ἐγχειμάζειν. (He evidently had Demosthenes’ words in mind.) Varro mentions σιροί as peculiar to Thrace and to Cappadocia. The comedian Anaxandrides, in a fragment where he makes fun of the marriage of Iphikrates with a daughter of Kotys, king

of Thrace, says, that among the wedding presents is to be βολβῶν τε σιρὸν δωδεκάπηχυν. In all these places the σιροί are spoken of with contempt, as Thracian and as poor wretched pits.

Now, it is to be observed that in the middle of the fifth century they were not only not confined to the barbarians, but used by the most civilised of the Greeks—a hundred years before Demosthenes delivered the speech in which the words quoted above occur. This interesting fact is proved by the Eleusinian Inscription, which I have described above, whose date, as I have said, is 446 B.C., or thereabouts—not later. In this document it is directed, οἰκοδομῆσαι σιροὺς τρεῖς Ἐλευσίνι for the reception of the first-fruits which were to be brought in for the two goddesses, worshipped with such peculiar solemnity at Eleusis. The word οἰκοδομῆσαι proves, moreover, that the Attic σιροί were not rudely-dug pits, or hewn-out caves, but regular granaries *built* underground; that their construction required expense is shown by the following clause which decrees that money is to be paid therefor, ἀπὸ τοῦ ἀργυρίου τοῦ τοῖν θεοῖν.

In the passage of Demosthenes, then, Θρακίοις is absolutely necessary along with σιροῖς to express the meaning required. Late writers, judging from such passages as these, thought that the use of σιρός for ‘corn-pit’ had never extended beyond Thrace. That it is a foreign word, probably Thracian, and that these corn-pits were primarily a peculiarity of that country, is beyond dispute; hence, it is evident that this method of preserving grain was introduced into Attica from Thrace, and improved upon by the Athenians; and the tradition of the Thracian Eumolpos having been created ἱεροφάντες of the Eleusinian worship by Erechtheus, its founder, points significantly to a very early introduction of the σιροί for special religious purposes.

III.—THE KOLAKRETAI.

On the functions of these officers the Eleusinian Inscription throws new light. That they had originally the management of all financial affairs, till the time of Kleisthenes, that he transferred these offices to the Apodektai, leaving with the Kolakretai only the duty of providing the meals in the Prytaneion; and finally, that Perikles, in instituting the pay of the Dikastai, assigned to the Kolakretai the office of paying them (cf. Arist. *Wasps*, 693, 724)—all this we knew already. But in the 51st line of the Eleusinian Inscription we find that the Kolakretai are to supply the money for buying and erecting two slabs on which a public decree was to be inscribed, οἱ δὲ Κωλακρέται δόντων τὸ ἀργύριον. This proves that they had some part in the financial affairs in 446 B.C.; and it seems probable that Perikles, at the time of his reforms, gave them some other duties connected with the state-money as well as that of paying the Dikastai, and so revived the office of Κωλακρέτης from the comparative unimportance in which it had been placed by Kleisthenes, and in which it had remained since his time.

In his long and learned discussion on this interesting Inscription, H. Sauppe has, curious to say, taken no note of this point.

I add a few Notes on Herodotus and Euripides:—

1. Herodotus iv. 153. Θηραίοισι δὲ ἔαδε ἀδελφείον τε ἀπ' ἀδελφεοῦ πέμπειν πάλῳ λαγχάνοντα καὶ ἀπὸ τῶν χώρων ἀπάντων ἑπτὰ ἐόντων ἄνδρας, εἶναι δὲ σφῆων καὶ ἡγεμόνα καὶ βασιλέα Βάττων. οὕτω δὲ στείλλουσι δύο πεντηκοντέρους ἐς τὴν Πλατίαν.

It is evident that Herodotus mentioned the number of men who were sent out to found Kyrene, or he would not have used the word *ἄνδρας*, which thus by itself is *de trop*. Stein saw this, and says in his note, that the number of the men "ist hinter *ἄνδρας* ausgefallen, lässt sich aber ziemlich genau aus den zwei Fünfigruderern schliessen, deren jeder etwa 80 Mann fasste (vii. 184. 15)." Now, in vii. 184, we find that Herodotus, in reckoning the total number of men in all the penteconteroi of Xerxes' force, takes 80 as the *average* number in each, saying that, in some there were more, but in others less. We should expect to find that ships sailing to found a colony peaceably would be filled with a larger crew than ships going on a war-expedition, any moment liable to be engaged in a sea-fight, where lightness of freight would be important. Hence I think Stein wrong in limiting the number to 80 in each. I would suggest to read *ἄνδρας* *δικοσίους*, C, the symbol for 200, having fallen out after the last letter of *ἄνδρας*. We have thus a number more likely to be fixed upon for a colony than 160 or thereabouts.

2. In Eurip. *Iph. in Tauris*, 1117, we have the words—

ζηλοῦσ' ἄταν διὰ παντὸς δυσδαίμον' (α),

where the chorus, Iphigeneia's faithful friends, are speaking and are the subject (ἐγώ) of *ζηλοῦσα*, while *ἄταν* refers to Iphigeneia's misfortunes. But it is nonsense to talk about *envying* their mistress's calamity, and so Nauck writes "*ἄταν* absurdum," and proposes *αἰῶ*; Koechly proposes *αἶσαν*, both of which give very poor sense. Monk's *ζηλοῦσα τὰν*, though less change, is not satisfactory. All three have assumed the corruption to be in *ἄταν*, but I find the difficulty in *ζηλοῦσ'*, which in any case is quite inappropriate. Read 'ΙΔΟΥC', and we have good sense;

the chorus has witnessed Iphigeneia's misfortunes from beginning to end. In the corresponding line in the Strophe we have δᾶφνάν answering to ἰδοῦσ'.

3. Frag. 362 (Ἐρεχθεύς), l. 38, τὴν οὐκ ἐμὴν πλὴν φύσει δώσω κόρην. A syllable is wanting. Nagel proposed the makeshift ἐμὴν οὖν. Read πλὴν ἧ φύσει, a redundancy which an ignorant scribe might easily omit.

4. Frag. 889 (Incertae Fab.), l. 4, we have πάντων ἡδιστος ἔφν θνητοῖς, purposing to be an anapaestic line. Nauck wishes to transpose θνητοῖς between πάντων and ἡδιστος. It seems to me more probable that, a word having dropped out after πάντων, θνητοῖς was added by a copyist to complete the line. I read ΠΑΝΤΩΝ ΑΛΛΩΝ ἡδιστος ἔφν, an instance of an ordinary Greek idiom.

JOHN B. BURY.

A FRAGMENT OF EURIPIDES.

READERS of HERMATHENA who have not seen the tract of M. Weil (*Un papyrus inédit de la bibliothèque de M. Ambroise Firmin-Didot. Nouveaux Fragments d' Euripide et d' autres poètes grecs, publiés par M. Henri Weil. Paris, 1879*) will meet with interest the (supposed) fragment of Euripides, recently discovered on an Egyptian papyrus of the second century before Christ. I give the verses as edited by M. Weil, reading ἀντίποιμι for ἀντί-
 παίμι in 10, and καλῶς for κακῶς in 37, both emendations of Cobet:—

ΕΥΡΙΠΙΔΟΥ.

ὦ πάτερ, ἐχρῆν μὲν οὖς ἐγὼ λόγους λέγω,
 τούτους λέγειν σέ· καὶ γὰρ ἀρμόζει φρονεῖν
 σέ μᾶλλον ἢ μὲ καὶ λέγειν ὅπου τι δεῖ.
 ἐπεὶ δ' ἀφῆκας λοιπὸν ἔστ' ἴσως ἐμὲ
 5 ἐκ τῆς ἀνάγκης τά γε δίκαι' αὐτὴν λέγειν.

Ἐκείνος εἰ μὲν μῆζον ἡδίκηκέ τι
 οὐκ ἐμὲ προσήκει λαμβάνειν τούτων δίκην.
 εἰ δ' εἰς ἔμ' ἡμάρτηκεν αἰσθέσθαι με δεῖ.
 ἀλλ' ἀγνοῶ δὴ τυχὸν ἴσως ἄφρων ἐγώ.
 10 ταῦτ' οὐκ ἂν ἀντίποιμι· καίτοι γ', ὦ πάτερ,
 εἰ τᾶλλα κρίνειν ἔστιν ἀνόητον γυνή
 περὶ τῶν γ' ἐαυτῆς πραγμάτων ἴσως φρονεῖ.

ἔστω δ' ὃ βούλει· τοῦτο τί μ' ἀδικεῖ, λέγε.
 ἔστ' ἀνδρὶ καὶ γυναικὶ καίμενος νόμος
 15 τῷ μὲν διὰ τέλους ἦν ἔχει στέργειν ἀεὶ,
 τῇ δ' ὅσ' ἂν ἀρέσκη τάνδρῳ ταῦτ' αὐτὴν ποιεῖν.

γέγονεν ἐκεῖνος εἰς ἔμ' ὄλον ἤξιον,
ἐμοὶ δ' ἀρέσκει πάνθ' ἃ κακέϊνω, πάτερ.

20 Ἄλλ' ἔστ' ἐμοὶ μὲν χρηστός, ἠπόρηκε δέ.
σὺ δ' ἀνδρὶ μ', ὡς φής, ἐκδίδως νῦν πλουσίῳ,
ἵνα μὴ καταζῷ τὸν βίον λυπυμένη.
καὶ ποῦ τοσαῦτα χρήματ' ἔστιν, ὦ πάτερ,
ἃ μᾶλλον ἀνδρὸς εὐφρανεῖ παρόντα με;
ἢ πῶς δίκαιόν ἐστιν ἢ καλῶς ἔχον
25 τῶν μὲν ἀγαθῶν με τὸ μέρος ὧν εἶχεν λαβεῖν,
τοῦ συναπορηθῆναι δὲ μὴ λαβεῖν-μέρος;

Φέρ' ἦν δ' ὁ νῦν με λαμβάνειν μέλλων ἀνὴρ
(ὃ μὴ γένοιτο, Ζεῦ φίλ', οὐδ' ἔσται ποτὲ
οὐκ οὖν θελοῦσης οὐδὲ δυναμένης ἐμοῦ),
30 ἦν οὗτος αὖθις ἀποβάλλῃ τὴν οὐσίαν,
ἐτέρῳ με δώσεις ἀνδρὶ; κἄτ' εἰς πάλιν
ἐκεῖνος ἐτέρῳ; μέχρι πόσου τὴν τῆς τύχης,
πάτερ, (σὺ) λήψει πεῖραν ἐν τῷ μῶ βίῳ;
ὅτ' ἦν ἐγὼ παῖς, τότε σ' ἐχρῆν ζητεῖν ἐμοὶ
35 ἀνδρ' ᾧ με δώσεις· σὴ γὰρ ἦν τόθ' αἶρεσις·
ἐπεὶ δ' ἀπαξ δέδωκας, ἤδη ὅστιν, πάτερ,
ἐμὸν σκοπεῖν τοῦτ'. εἰκότως, μὴ γὰρ καλῶς
κρίνας' ἐμαντῆς τὸν ἴδιον βλάψω βίον.

Ταῦτ' ἐστίν· ὥστε μὴ με, πρὸς τῆς Ἑστίας,
40 ἀποστερήσης ἀνδρὸς ᾧ συνώκισας.
χάριν δικαίαν καὶ φιλόανθρωπον, πάτερ,
αἰτῶ σε ταύτην. εἰ δὲ μὴ, σὺ μὲν βίᾳ
πράξεις ἃ βούλει, τὴν δ' ἐμὴν ἐγὼ τύχην
44 πειράσομ' ὡς δεῖ, μὴ μετ' αἰσχύνῃς, φέρειν.

Στίχοι ΜΔ

ΕΥΡΙΠΙΔΗCCΜΟΔΡΕΓΑΤΗΣ.

This fragment has naturally attracted much attention, both from its own beauty and from the fact that it is unanimously declared to be the work of Euripides. M. Weil ascribes it to the *Temenidae*, and is supported by

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F. Blass (Rhein. Mus. 1880, p. 74). Th. Bergk (Rhein. Mus. 1880, p. 246) assigns the passage to the *Cresphontes*; Theodor Kock (Rhein. Mus. 1880, p. 264) to the *Arche-laüs*; and Cobet (*Mnemosyne*, 1880, p. 56) looks for its source in some satyric drama of Euripides. The reasons for which this fragment is held to be the work of Euripides are certainly strong; but it seems to me that considerations of some weight, leading to a different conclusion, have been overlooked. The reasons to which I refer are two: (1). The fragment is said to have at its beginning the word ΕΥΡΙΠΙΔΟΥ, as it has at its end undoubtedly the name ΕΥΡΙΠΙΔΗΣ, in the corrupt epigraph ΕΥΡΙΠΙΔΗΣ ΣΜΟΔΡΕΓΑΤΗΣ, whatever may be the meaning of the letters which are found in combination with it. (2). The metre is held to be decisive that the fragment could not belong to Comedy, though it is allowed that the tone is just such as would lead us to ascribe the passage to Menander. 'Enfin,' writes M. Weil, p. 11, 'aucun mot ne sort du *genus tenue*, du ton de la conversation aisée et attique, celui qui fait le charme des plus beaux morceaux de Ménandre. Cela est vrai; mais il y a une raison péremptoire qui nous interdit de penser à une comédie. La facture des vers n'est pas celle des poètes comiques: aucune des libertés qui caractérisent le trimètre de la comédie ne se rencontre dans notre morceau. Pour ne parler que de ce qu'il y a de plus saillant, on n'y voit nulle part un anapeste en dehors du premier pied; et, dans un morceau d'une si grande étendue, ce seul argument suffit pour exclure l'idée qu'il soit tiré d'une comédie.' So Cobet (*Mnemosyne*, 1880, p. 60) allows that the tone is essentially that of Comedy, 'idem iisdem verbis Menander dicere potuisset'; but adds, 'sed, ut Weilius ἀναντιλέκτως demonstravit, Tragici poetae haec esse numeri declarant.' He assigns the fragment to some satyric drama of Euripides, but he founds his theory solely on the want of

elevation in the tone: 'plane sunt sermones *repentes per humum*.' As far as the metre is concerned, he would allow a genuinely tragic origin for it, as do the eminent scholars to whom I have already referred.

Now, as so much has been made to rest on the metre, it is worth while to point out that the verses, as they stand, after passing through the crucibles of so many deservedly celebrated foreign critics, still present a metrical phenomenon which is incompatible with the theory that they ever formed part of a tragedy. In v. 10—

ταῦτ' οὐκ ἂν ἀντίποιμι· καίτοι γ' ὦ πάτερ—

there is a distinct violation of the pause; and the verse is evidently sound, and in no way lends itself to emendation. But a violation of the pause¹ is quite as fatal to the theory of a tragic origin as the occurrence of an anapaest after the first foot. Moreover, I think it will be admitted by everyone who has an ear, that we have an anapaest in the fourth place in v. 32, though of course the verse may be forced into conformity with tragic usage. But everyone accustomed to tragic rhythm will feel that the verse was written to be scanned

ἐκεῖ | vos ἐτέ | ρῳ μέχ | ρι πόσον | τὴν της | τύχης |,
and not

ἐκεῖ | vos ἐτέ | ρῳ μέχρι | πόσον | κ.τ.λ.,

though the latter scansion is of course possible.

But to return to the first ground on which scholars have agreed that the fragment is Euripidean. They have

¹ One must not be surprised that a violation of the pause should be overlooked by foreign scholars, however eminent, when we remember that the illustrious Madvig, in the first volume of his *Adversaria Critica*, proposed to read in Aesch. *Agam.* 1196—

ἀπαρτήρησον προύμοσόν μὴ εἶδέναι.

This English discovery has failed to take root on the Continent. Though fully owning the absolute truth and importance of the Porsonian canon, foreign philologists often forget to apply it in practice.

agreed in reading ΕΥΡΙΠΙΔΟΥ at the head of the piece. Now, a careful study of M. Weil's facsimile does not seem to me to lead one to this conclusion. I fancy that M. Weil, seeing that the corrupt letters at the end of the piece, whatever they may mean, certainly include the name ΕΥΡΙΠΙΔΗΣ, leaped to the conclusion that the name at the top must certainly be that of Euripides also. But it is quite possible that the letters at the end may have no reference to the fragment after which they stand, but may refer to another extract, really Euripidean, which the scribe intended, but ultimately failed, to commit to writing. The letters at the beginning of the piece, which are supposed to represent ΕΥΡΙΠΙΔΟΥ, are extremely obscure. For the termination -ΙCΙΟΥ or -ΚΙΟΥ has been suggested, but it is scarcely safe to attempt deciphering the name without an inspection of the second MS. which exists (see Weil). These letters represent, perhaps, not the name of the writer of the piece, but of the speaker of the verses. It has been pointed out how closely the passage resembles *Stichus*, Act. 1.; and it is possible that Plautus there used this very piece. The fragment before us might have been the words of some Greek *Pinacium*; and this hypothesis gains a strong confirmation if, as Cobet thinks, the fragment is not one connected piece, but contains only the views of the girl, the arguments of her father in answer being designedly omitted. In that case nothing would be more natural than that the lines should have prefixed to them the name, not of the poet who wrote, but of the character who spoke them.¹

¹ Dr. Maguire reminds me that it was the habit of antiquity to indicate a passage referred to, not by the name of the poet, but of the character prominent in the passage. The comment of the Scholiast on κατ' Αισχύλου, Rep. 361 B, is Αισχύλου δι' Αμφικράδου 'ού

γὰρ δοκεῖν,' κ.τ.λ. Hence, if we have here only the girl's view of the question, it is probable that the scribe to whom we owe the piece would have prefixed her name, not that of the poet, to the extract. Tac., *Dial.* 37, calls the Philippias *Antonius*.

As to the tone, everyone will agree with Cobet that it is non-tragic; so also is the metre as it stands, though the metre would admit the hypothesis that the source of the extract is a satyric drama. The *Cyclops* contains both anapaests after the first foot, and violation of the pause: this, however, is irrelevant, for Cobet pronounces for a satyric origin solely on account of the tone; as far as the metre goes, he would admit the verses to belong to a tragedy. But the phraseology is also un-tragic, e. g. *τυχὸν* v. 9, which is found in Menander, *ἠπόρηκε, συναπορηθῆναι*, vv. 19, 26, in the sense of "to be in money difficulties," *πρὸς τῆς Ἑστίας*, v. 39. Finally, as to the tone, will anyone but M. Cobet (who of course is *instar multorum*) say that it resembles satyric drama more than it resembles tragedy? To me the fragment reads more like the *Electra* than the *Cyclops*, but seems to breathe the very spirit of Menander.

The question then resolves itself into this. The passage is ascribed to Euripides—(1) because the fragment is supposed distinctly to claim him as the author; (2) because the metre is not that of comedy. Now, I have endeavoured to show that we have not the unequivocal testimony of the fragment to its Euripidean origin. And I have shown that it contains (certainly) one violation of the pause, and (most probably) an anapaest after the first foot. Is it impossible that a comic piece of 44 lines should present so few deviations from tragic usage? I answer, that such a phenomenon is undoubtedly rare, but not unexampled. On turning to Meineke's *Comic Fragments*, vol. iv., which contains the fragments of the New Comedy, I find that few of the fragments are as long as the one before us; and that, as a rule, an extract of the same length contains half a dozen violations of tragic usage; but I find that the longest fragment in the volume—a remnant of the ΣΥΝΤΡΟΦΟΙ of Damoxenus—

in 68 lines does not afford a single instance of an anapaest after the first foot, except in v. 13 :

μὴ Δημόκριτόν τε πάντα διανεγνῶκόντα ;

and this verse would stand good in tragedy, which admits an anapaest in the case of a proper name. A needless conjecture of Dobree would introduce an anapaest in the 2nd foot in v. 44, but the MSS give the verse free from any infringement of tragic law. This fragment has a violation of the pause in v. 31 ; but no other in the whole piece, unless we read unnecessarily with Meineke against the MSS, *οὕτω συνδοκεῖ* for *οὕτω σοι δοκεῖ* in v. 67. Here, then, we have in an undoubtedly comic piece, of considerably greater length, a considerably greater conformity to tragic metre than meets us in the fragment of the papyrus which, on metrical grounds alone, has been so universally ascribed to a tragic poet.

It seems to me, therefore, that the tone and language of the piece shows it not to be by Euripides or any tragic poet, even in a satyric play ; that the versification happens to be exceptionally dignified, but does not warrant us in bringing in a verdict contradicted by the whole tone and character of the passage ; that the Euripidean authorship would never have been admitted but that the fragment is supposed itself to testify (which I submit that it does not) unequivocally to its Euripidean origin ; and that nothing but most unequivocal testimony ought to justify us in admitting a piece so redolent of the New Comedy within the precincts of Tragedy ; or of Satyric Drama, which did not deal with the realism of everyday life, but presented fanciful burlesques of tragic themes.

I add the recently discovered fragment from the Melanippe. There can be no doubt about the Euripidean origin of this piece, for vv. 15-18 are quoted by Stobaeus,

Flor. 86. 9, as coming from the *Μελαντιππη* of Euripides. Nor has the fragment anything in it inconsistent with its Euripidean authorship. The passage does not possess the intrinsic merit of the other fragment, but will have an interest for readers of *HERMATHENA* who have not yet seen it. On v. 9 (B.) I think we should certainly read *εὐλείμῳ* for *ὕλμῳ*. Egyptian scribes constantly confound *ι* and *ει*. In v. 7 *λελειμμένοι* appears as *λελιμμένοι*. Other characteristic errors are confusions between *η* and *ε*, *ω* and *ο*, *δ* and *τ*, arising, no doubt, from an insensibility to the difference in *sound* between these letters. The fragment is written on the two sides (A. and B.) of a leaf, which has been torn obliquely from right to left. Hence the first half fails in the last words of the verses; the second half fails in the first words. I give the text as restored by Weil:—

A.

(ΑΓΓΕΛΟΣ) — — — —

- τίς ἦν ὁ [τυφλὸν τόδε βέλος μ]εθεῖς ἐμοί.
 ὡς δ' οὐκ ἐφαινόμεσθα, σίγα δ' εἶχομεν,
 πρόσω πρὸς αὐτὸν πάλιν ὑποστρέψας πόδα
 5 χωρεῖ δρομαίαν, θῆρ' ἐλεῖν πρόθυμος ὢν,
 βοᾷ δέ. κἀν τῷδ' ἐξεφαινόμεσθα δὴ
 ὀρθοσταδόν, λόγχαις ἐπείγοντες φόν[ον.
 τὰ δ' εἰσιδόντε διίπτυχον θείου κάρ[α
 ἦσθησαν, εἶπον θ' "εἰα, συλλάβεσθ' ἄγρα[ε,
 10 καιρὸν γὰρ ἦκεθ'." οὐδ' ὑπώπτενον [δόλον,
 φίλων προσώπων εἰσορῶντες δ[ίμματα.
 οἱ δ' εἰς τὸν αὐτὸν πίτυλον ἡπειγ[ον δορός,
 πέτροι τ' ἐχώρουν χερμάδες θ' ἤμῶν πάρα,
 ἐκεῖθεν, οἱ δ' ἐκεῖθεν ὡς δ' ἦε[ι μάχη
 σιγὴ τ' ἄφ' ἡμῶν, γνωρίσαντ[ε δὴ τὸ πᾶν
 15 λέγουσι "μητρὸς ὦ κασίγνη[τοι φίλης,
 τί δρᾷτ'; ἀποκτείνοντες ο[ὕς ἦκιστ' ἐχρήν
 φωρᾶσθε· πρὸς θεῶν, δρᾷτ[ε μηδαμῶς τάδε."

σὼ δ' αὐταδέλφω χερμ[άδ' αἵρουσιν χεροῖν,
 λέγουσ' ἦ, ὥς ἔφυσαν ἐκ δούλης ποθέν,
 20 κοῦ δεῖ τύραν[α σκῆπτρα καὶ θρόνους κρατεῖν
 πρεσβεῖ ἔχοντ[ας δυσγενεῖς τῶν εὐγενῶν.
 κάπειτα δ' εἰς — — —
 .ν λῆμμ' ἔχο — — —
 — — —
 25 — — —

B.

ἔσφηλέ τ' εἰς γῆν [τὸν βίον τ' ἀ]φ[εῖ]λετο·
 ἡμῶν δ' ἔχωρεῖ κωφὰ πρὸς γαῖαν βέλη.
 δ]υοῖν δ' ἀδελφοῖν σοῖν τὸν αὐ νεώτερον
 5 λό]γῃ πλατεῖα συοφόνῃ δι' ἡπατος
 παῖσ]ας ἔδωκε νερτέροις καλὸν νεκρὸν
 Βοιω]τός, ὅσπερ τὸν πρὶν ἔκτεινεν βαλὼν.
 κἀντεῦ]θεν ἡμεῖς οἱ λελειμμένοι φίλων
 θᾶσσοι] πόδ' ἄλλος ἄλλος' εἵχομεν φυγῇ·
 εἶδον δὲ τ]ὸν μὲν ὄρεος ὑλίμψ φόβῃ
 10 κρυφθέν]τα, τὸν δὲ πευκίνων ὄζων ἔπι·
 οἱ δ' εἰς φάρ]αγγας δύνον, οἱ δ' ὑπ' εὐσκίους
 πέτρους κα]θίζον· τῷ δ' ὄρωντ' οὐκ ἡξίου
 δούλους φονε[ύειν φασγάνοις ἐλευθέροις.
 τοιάνδε μοῖραν σ]ῶν κασιγνήτων κλύεις.
 15 ἐγὼ μὲν οὖν οὐκ] οἶδ' ὅτψ σκοπεῖν χρεὼν
 τὴν εὐγένειαν· το]ῖς γὰρ ἀνδρείους φύσιν
 καὶ τοὺς δικαίους τῶ]ν κενῶν δοξασμάτων,
 κἂν ὥσι δούλων, εὐγεν]εστέρους λέγω.
 (ΧΟ.) αἰαί, κέκρανται μεγάλα πρὸς] κακοῖς κακά,
 20 οὐδ' ἡδόμεισθ' ἀγῶνι δυστυ]χεῖ δόμοις,
 δισσῶν ἀδελφῶν μόρον ἀκούο]ντες σέθεν.
 (ΘΕΑΝΩ) — — — — — εν ἐλπιδῶν
 — — — — — ται μέγα
 — — — — — αι θε-

ROBERT YELVERTON TYRRELL.

ETYMOLOGICAL NOTES ON LIDDELL AND SCOTT'S LEXICON.

THE object of the following Paper is to point to a number of erroneous statements on etymology occurring in the Lexicon of Liddell and Scott. The spirit in which I have undertaken this office will not be misconceived by those who remember what I said respecting that Lexicon in a former article (*HERMATHENA*, vol. i. p. 410). The opinion there expressed, that it is 'a work of which English scholarship may well be proud,' I still entertain. But precisely because it is the best Greek Lexicon in our language, and is likely long to remain so, it is desirable that scholars should assist in removing the blemishes which here and there disfigure it: 'naevos in corpore pulchro.' Whilst I advise every student to prize his Liddell and Scott, I am sure that anyone who will take the trouble of entering, in his copy of the book, the substance of the following notes, will thereby increase its value in a small, indeed, but yet appreciable, degree. It will be observed that I have commented on no statement which, though open to exception, can be regarded as capable of defence, or admitting of a reasonable difference of opinion: my strictures all relate to assertions which are undeniably wrong. I am far from having exhausted the list of such errors in the Lexicon, but I think the gravest ones are, most of them, included in my catalogue.

1. αἴξ. This word is said by L. and S. to be from αἴσσω. It is added—'the root is perhaps ἀγ-: cf. Lat.

agilis. But, on *ἀίσσω*, that verb is said to be perhaps akin to *ἄω*, *ἄημι*. These discordant statements must perplex a student.

2. *ἄλκη*, 'an elk,' is said to be probably akin to *ἐλαφος*, and O. H. G. *elaho* is compared. *Elaho* is, no doubt, the Germanic representative of *ἄλκη*, in which the guttural is radical; but *ἐλαφος* has no connexion with either of those words. Curtius compares *ἐλαφος* with *ἐλλός*, *ἐλλός*.

3. *ἀμολγός*. On this word it is said that Buttmann, in his *Lexilogus*, 'rejects all derivations from *ἀμέλω* as childish,' making *ἀμολγός* = *ἀκμή*. But anyone who reads Buttmann's article will see that he gives it as his opinion (and Lachmann's also) that the phrase *ἐν ἀμολγῷ* came to mean *ἐν ἀκμῇ* through the notion of a full, swelling udder, and so he *does* derive the word from *ἀμέλω*. It is only as to the *way* of connecting the idea of *ἀμολγός* with that of *milking* that Buttmann differs from the earlier etymologists. The truth, however, seems to be that *ἀμολγός* and *ἀμέλω* are not at all cognate.

4. *ἀνήρ*. 'The Greek root is *ἀνδρ-*.' This is of course wrong. The *stem* is *ἀνερ*; the *δ* is only euphonicly inserted when that stem has been shortened to *ἀνρ*. The root is *νερ*: indeed it is stated immediately after, in contradiction of what precedes, that the *α* seems not to belong to the root.

5. *ἄοζος* is said to be 'perhaps from a copul., *ἐπομαι*,' and *νίζω* and *νίπτω* are given as having a similar relation of the dental and labial. But *ἐπομαι* (cf. *sequor*) is known to be from a root *sak*: now it is a law of Greek phonology that *ζ* cannot originate from a sharp mute, and there is no trace of a modification of *sak* to *σαγ*. *Νίζω* implies a root *νιγ*, which appears in Sanskrit *niḡ*; and, *alongside of this*, existed a root *νιβ* (cf. *χέρ-νιβα*), from which *νίπτω* was formed. *Ἀοζος* without doubt = *ἀ-όδ-ιος*, 'fellow-way-farer.'

6. ἀοσσητήρ is said to be the same as ἄοζος. But the *σσ* indicates a sharp mute followed by *γ*. It is therefore probable (as Curtius thinks) that the original form of the word was ἀ-σοκ-γητηρ, from the root *sak*, seen in Lat. *sequ-or*, *soc-ius*.

7. ἀπολαύω is said to be connected with λάω (λῶ), to desire. But the latter word is = λα(σ)ω; cf. λαστή, λάσ-ταυρος, Goth. *lus-tu-s*; whilst ἀπολαύω has for its root λαF, a modification of λν, and, through λαF and λν, respectively, is connected with λεία, λήϊς, and Lat. *lu-crum*.

8. ἀρύω is compared with Lat. *haurio*. This latter is a difficult word, but it is plain that the stem is not *haur-*, but *haus-*; it is therefore impossible to regard it as cognate with ἀρύω, even if the initial *h* could be explained on that hypothesis.

9. αὐγή is said to be 'perhaps from the same root as *oculus*.' But the true Greek cognates of the Latin word are given under ὄψ.

10. ἄχνη is said to be 'akin to χνόος, λάχνη, Lat. *lanugo*.' But is it not apparent from the comparison of λάχνη with Lat. *lana* (cf. ἀράχ-νη, *arā-neā*) that the root of λάχνη is λαχ? And how can χνόος be connected with that root?

11. βατέω is (on letter β) said to be for πατέω. But s. v. it is rightly connected with βαίνω; and on πάτος the quite different relations of πατέω are correctly given.

12. βένθος is compared with Lat. *fundus*. But the two words are not cognate. The I. E. root of βαθύς, with which βένθος goes, had initial *g* (see art. on βαθύς). *Fundus* is really connected with Gr. πνθ-μήν, which, as Grassmann shows, had *bhudh* for its I. E. root, and therefore originally began, not with π, but with φ.

13. γελάω is compared with Skr. *hlād* (*gaudere*) and Eng. *glad*. But the Greek representative of Skr. *hlād*

(which implies original initial *gh*) is κέ-χλαδ-α; and the notion of a connexion between γελάω and *glad* is at variance with Grimm's Law.

14. γηρύω. As related with this word is given, after Curtius, Skt. *gir* (vox); and with this is compared the English *cry*. But *cry* is not Germanic: it is Fr. *crier*, which, as Prov. *cridar*, Span. *gritar*, show, comes from Lat. *quirilare*.

15. γλαυκός is s. v. said to be from the 'root [?] λάω, to see, γλαύσσω, λεύσσω, λευκός, Lat. *luceo*, *lux*, γ being dropped.' But the root *luk* is most widely diffused through the Indo-European family, appearing in Sanskrit and Zend (in the form *ruk*), in Latin, Gothic, and O. H. German, Eccl. Slavonic and Lithuanian, and in Irish, and in none of them is a trace of an original initial γ. Λευκός, *luceo*, *lux*, and probably λεύσσω, must therefore be joined; and from this group that of γλαύσσω, γλαυκός, γλαύξ, must be kept apart. Γλήνη, γλήνος, and λάμπω are also wrongly referred to λάω, which, if all that is said about it be correct, must have had initial γ; but what evidence is there for γλάω or for γλάμπω?

16. Letter δ. It is wrong to represent μίγδα, κρύβδα, compared with μίγα, κρύφα, as instances of the 'insertion of δ to give a softer or fuller sound, like the δ in ἀνδρός.' Μίγ-α and μίγ-δα are two different adverbial formations from the same root: with the latter cf. ἀναφαν-δά.

17. δάπεδον is, under ἔδαφος, implied to be from the same root as τάπ-ης, and is indeed, under τάπης, said to be probably akin to that word; but s. v. it is stated to be 'probably from ζάπεδον, i. e. διάπεδον.' Both accounts cannot be right.

18. δασύς is compared with λάσιος; but there is no example of the change of *d* to *l*, or *vice versá*, within the limits of the Greek language.

19. δειλός (on letter δ) is said to present an instance of λ taking the place of δ, as in *lacrima* for *dacrima*. But it is

absurd to derive δειλ-ός from δειδ-ω: the radical part of the word is δει-; -λος is suffix only, and λ is not substituted for δ.

20. δειμός is, on letter δ, identified with Lat. *timor*. But Greek δ is not represented by Latin *t*. The origin of *timor* is obscure, but it is most probable that the *m* is radical.

21. δέω. English *dew* is compared with this Greek verb, in violation of Grimm's Law; but the same word is rightly compared with τή-κω s.v. A relation is affirmed between δέω and δέφω, δέψω; but without any grounds to support it.

22. εἰλαπίνη is a word whose origin is unknown. It is misleading to give so-called 'usual' derivations of it from πίνειν κατ' εἶλας, and from λάπτω.

23. εἶλω. On this word is given the following note:— 'With the Aeolic Φέλλω, cf. Lat. *pello*.' That is to say, it is implied (of course, wrongly) that Latin *p* can represent the digamma.

24. εἰμί. The root of εἰμί is said (can it be by an error of the press?) to be ἐ-; it is, of course, really ἐσ-.

25. ἔλαφος is s.v. compared with Germ. *laufen*, Eng. *leap*. But Germ. *f* does not correspond to Gk. φ, and a connexion between the words is impossible. It is implied in the article on ἔλαφος that the comparison with *laufen* is taken from Curtius, but that etymologist never made such a suggestion; he compares (*h*)*laufen* with κραπ in κραπινός (= κραπ-ινός), καρπ-άλιμος.

26. ἔλη, εἶλη, is said to be akin to σέλας, σελήνη, and this is probably right; though, as Curtius remarks, the *rap-prochement* is not free from difficulties. Ἥλιος is made one of the same set of words, which again is possible, though Curtius appears to be right in tracing it to a different source. But how can ἔλη, as is here asserted, correspond to Germ. *Helle*?

27. *ἔνερτοι*. On this word it is said that *inferus*, &c., in Latin comes from *in*, with the digamma or F inserted. But the digamma is very different from *f*; and this account of *inferus* is erroneous.

28. *ἔννυμι*. The root is said to be 'ἔω, or rather *Ftō*.' Not only is it quite wrong to speak of ἔω as the *root*, but if anything of such a form could be called so, it ought to be *ἔσω* or *Ftō-s*, for *ἔννυμι* = *Ftō-vu-mi*, or how else can *ἔσ-θής* or *vestis* be explained?

29. *ἐρις* is treated as cognate with Lat. *rixa*. But the guttural of the latter word refutes this supposition (though Roby and others also favour it); the stem of *ἐρις* is *ἐρι-*, and there is every reason to believe that the *δ* of the oblique cases arose from parasitic *γ*. There is, perhaps, a real connexion between *ἐρις* and Lat. *in-ri-to*.

30. *ἔρρω*. On this word *ῥέω* and *ῥάω* are said to be connected. But *ῥέω* is s. v. rightly compared with Skr. *sru*, whereas *ῥάω* s. v. is said to be 'probably akin to *ῥήγνυμι*,' which, in the article on it, is spoken of as having initial digamma. It is clear that *ῥρᾱγ* cannot be cognate with *sru*.

31. Letter ζ. In the article on this letter the sound of French *j*, as in *jalousie*, is treated as if it were identical with that of *j* in *Janus* or *jugum*.

32. ζάω is, in the same article, derived from *ἄω*, by ζ being supposed to be 'put before' the latter, 'like a mere breathing.' But ζάω, in its own place in the Lexicon, is connected with Skt. *jītv*.

33. *ἡμι* is said s. v. to be 'treated [by whom?] as *φημι*, with the first letter omitted,' and, in the article on *φημι*, is said to be a shortened form of the latter word; but it is at the same time compared (after Curtius) with Skr. *ḍha*, Lat. *aiō*, *ad-ag-ium*, whereas *φημι* is compared with Skt. *bhā* (see *φάω*).

34. *θέρω* is s. v. connected with Lat. *torreo* and Eng. *dry*.

And it is said that Σείριος, σειρός must belong to the same root. From the way in which the name of Curtius is introduced at the end of this etymological note, it might be inferred that the assertions I have quoted are his or in accordance with his views: but they are really at variance with his principles. He separates τέρομαι, *torreo* (I. E. root *tars*) altogether from θέρω; and brings the latter word and Σείριος, not from the same, but from two quite different Indo-European roots, viz., *ghar* and *swar*.

35. κείμαι. With this word not only rightly Lat. *quies*, but wrongly *cubo*, *cumdo* are compared. The root of κείμαι is κί (Skr. *ḥi*); the root of *cubo*, *cumdo* is κυφ, seen in κυφ-ός, κύπ-τω.

36. κήρυξ is said (on letter κ) to correspond to the English *herald*. But *herald* is certainly not akin to the Greek word; for some remarks on its origin, see *heraut* in Littré's French Dictionary.

37. κηρύσσω is said (under that word) to be 'probably akin to γήρυς, γήρυω.' But the latter words must be kept apart from it, κ not replacing γ, or *v. v.*

38. κίβισις is strangely said to be akin to Lat. *corbis*. It is at the same time represented to be connected with κύμβη, which word is s. v. compared with κύβη, κύπελλον. Can it be seriously asserted that *corbis* goes with these last?

39. κισσός is said to be akin to ἰξός. But this it is impossible to believe, when we remember that the latter word, as Lat. *viscus* indicates, is = Φισκος.

40. κίω is (on letter κ) said to be from ἴω [= εἶμι] by prothesis of κ. But the same word is s. v. rightly compared with Skr. *ḥi* (acuere). These two accounts cannot be reconciled.

41. κόριανος is compared (rightly, it would seem, notwithstanding the diphthong) with κύριος. But it is said to be also akin to κάρα, with which it has really no connexion. It is further asserted to be the same with τύραννος, the latter

being its Doric equivalent; but τ for κ is not Doric (see Ahrens, ii. 79), though κ for τ is found in that dialect in adverbs of time, as $\pi\acute{o}\kappa\alpha$, $\acute{\alpha}\lambda\lambda\omicron\kappa\alpha$; and the less said in a lexicon about the etymology of $\tau\acute{\upsilon}\rho\alpha\nu\nu\omicron\varsigma$ the better, for the origin of the word is unknown.

42. $\kappa\rho\alpha\acute{\iota}\nu\omega$. Of this the root is said to be $\kappa\rho\alpha$, $\kappa\rho\alpha\iota$. But this is plainly wrong—as much wrong as it would be to say that the root of $\beta\alpha\acute{\iota}\nu\omega$ is $\beta\alpha$, $\beta\alpha\iota$ (instead of $\beta\alpha$, $\beta\alpha\nu$). The real root is $\kappa\rho\alpha\nu$ ('weiterbildung' of $\kappa\rho\alpha$), $\kappa\rho\alpha\acute{\iota}\nu\omega$ being = $\kappa\rho\alpha\nu\text{-}\gamma\omega$.

43. $\kappa\rho\alpha\iota\pi\nu\acute{o}\varsigma$ is said to be from $\acute{\alpha}\rho\pi\acute{\alpha}\zeta\omega$. But κ is neither prefixed to, nor lost before, vowels at the beginning of words in Greek. $\kappa\rho\alpha\iota\pi\nu\acute{o}\varsigma$ (= $\kappa\rho\alpha\iota\pi\nu\omicron\varsigma$) and $\kappa\alpha\rho\pi\text{-}\acute{\alpha}\lambda\mu\omicron\varsigma$ have nothing to do with $\acute{\alpha}\rho\pi\text{-}\acute{\alpha}\zeta\omega$, which goes with $\tau\alpha\rho\text{-}\iota\acute{o}$.

44. $\kappa\rho\acute{\eta}\nu\eta$. Respecting this word, after the correct account of it, that, namely, which refers it to $\kappa\acute{\upsilon}\rho\alpha$, $\kappa\acute{\alpha}\rho\eta\nu\omicron\nu$ ('fountain-head'), is added as an alternative explanation, 'or perhaps from $\rho\acute{\epsilon}\omega$.' This is of course impossible, being inconsistent with the fact that the I. E. root of $\rho\acute{\epsilon}\omega$ is $sr\upsilon$.

45. $\kappa\rho\epsilon\acute{\iota}\varsigma$. On this word Lat. *pecten* is compared: why, it is not easy to see. It is elsewhere rightly spoken of as related to *pecto*, Gr. $\pi\acute{\epsilon}\kappa\omega$ (see art. on this last word).

46. $\lambda\alpha\mu\pi\acute{\eta}\nu\eta$ is said s. v. to be probably from $\acute{\alpha}\pi\acute{\eta}\nu\eta$, with λ prefixed. On λ , $\acute{\alpha}\pi\acute{\eta}\nu\eta$ is said to be from $\lambda\alpha\mu\pi\acute{\eta}\nu\eta$, by the dropping of the λ . Both accounts cannot be right, and it is in the highest degree improbable that either is so. Curtius connects $\acute{\alpha}\pi\text{-}\acute{\eta}\nu\eta$ with Gk. $\acute{\alpha}\pi\tau\omega$, Lat. *ap-ere*.

47. $\lambda\acute{\alpha}\sigma\kappa\omega$. This word is for $\lambda\acute{\alpha}\kappa\text{-}\sigma\kappa\omega$ (cf. Lat. *disco* = *dic-sco*), and *loquor* is rightly compared with it. But what is meant by giving *queror* also as cognate with the Greek verb?

48. $\lambda\epsilon\acute{\iota}\omicron\varsigma$. With this word the English *level* is compared. But there is no relation whatever between them.

Level is from the Lat. *libella*. Compare the French etymologists on the origin of *niveau*.

49. *λίπος*. On this word it is said that perhaps the English *salve* comes from the same root, *λιπ*. This is a remnant of the erroneous view in the early editions, which represented *ἀλείφω* as formed from α 'copulative,' and root *λιπ*. Copulative α = *sa*, but this is not true of the prothetic α, which is the one found in *ἀλείφω*. In the same article Lat. *liquor* is said to be akin to *λίπος*, but, though this is phonetically possible, the senses of the words are too different to admit of their being connected.

50. Letter *μ*. *ῥραξ* is said to be = *μυραξ*. The latter word is not Greek; but L. and S. apparently mean that *ῥραξ* is to be brought into relation with Lat. *mus*, *muris*, by supposing a loss of initial *μ*. But this is inconsistent with both the accounts of *ῥραξ* given s. v.: the right one, which compares it with Lat. *sorex*, and the wrong one, which supposes it to be connected with *ῥς*.

51. *μάλη*. The Lat. *āla* is said to be *μάλη* with the *μ* thrown off. But *axilla* being the dimin. of *ala*, we may infer that *ala* = *αχ-la*; and with this last Gr. ἀκ-χός (= ὤμος, Hesych.) and O. H. G. *ahsala* (Achsel) are cognate, as well as, most probably, Lat. *axis* and Germ. *Achse*. Neither *μάλη* nor *μασχάλη* has anything to do with *ala*.

52. *μορτός*, *βροτός*. The true statement that these words have nothing to do with *μερ*, *μείρομαι*, is found both in the article on *μορτός* and that on *μείρομαι*. Yet in the latter article the connexion of Lat. *mors* with Gk. *μόρος* and *μοῖρα* is re-asserted.

53. *νέκταρ* is said to be 'usually derived from *νε-*, *νη-*, not, and *κτάω*, *κτείνω*.' But such an absurd etymology ought not to appear in a Lexicon of our time (on the *νε*, see art. on *νέποδες*). Why not admit that we are ignorant of the origin of the word?

54. *οἰωνός* is said to be 'properly a *solitary* or *loneflying*'
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bird.' That explanation is given only to supply a colour for the untenable derivation from *ολος*. There can be no doubt that the word is akin to *avis*, being = *ὄφι-ωνός*: cf. *νίωνός*.

55. Πάν. The Lat. *Faunus* is said to be merely another form of the Greek name. Though this assertion has been often made, it is certainly wrong. The Roman word is one too ancient and popular to have been borrowed from the Greek, and, even if it were, all analogy is against its having, in that case, taken such a shape. If it were a primitive Latin word, coming from the same I. E. source with Πάν, how could the initial *f* or the diphthong be explained?

56. *πείρω* is compared with Lat. *veru*. But Latin *v* cannot represent Greek *π*.

57. *πῆμα* is said to be from '*πάσχω*, fut. *πήσομαι*.' But, on *πάσχω*, the form *πήσομαι*, found in a few texts, is stated to be 'merely an error of the copyists.'

58. *πόλχος*. Lat. *volgus* and Engl. *folk* (O. H. G. *folc*) are here represented to be akin to each other, and, through the [supposed] Cretan form *πόλχος*, to *ὄχλος*. *Folk* has really nothing to do with *volgus*; its initial *f* represents not *v* but *p*; it is cognate with *πολ-ύς*, *πο-φυλ-ος*, *πλη-θος*, *ple-bes*, and, with them, goes back to I. E. *par*, to fill.

59. *πόντος* is said to be akin to *βένθος*, *βάθος*, and Lat. *fundus*. It cannot, according to phonological law, be akin to any of them. 'Perhaps also,' it is added, 'to *πάτος*.' With *πάτος* it is indeed possible that *πόντος* is cognate, but *πάτος* cannot be connected with *βένθος* and *βάθος*, nor with *fundus*.

60. *πούς*, *ποδ-ος*. To the analogues given by Curtius is added, with a 'perhaps,' *πάτος*. But *τ* cannot represent an original *d*.

61. *πύργος* is said to be akin to Germ. *Burg*, our *burgh*. But this statement is at variance with Grimm's Law.

Greek π would become f in Gothic and English. *Burg* (Goth. *baurg-s*) is really connected, through Gothic *baigan*, to guard, with $\phi\rho\acute{\alpha}\sigma\sigma\omega = \phi\rho\alpha\kappa-\gamma\omega$.

62. $\rho\acute{\eta}\gamma\gamma\upsilon\mu\iota$. This word is said to be 'probably akin to Lat. *frio*, *friare*.' But the Latin word cannot be separated from *frico*, which is elsewhere correctly said to be connected with $\chi\acute{o}\iota\omega$ (see art. on this word).

63. $\rho\acute{\iota}\psi$ is said to be connected with $\rho\acute{\iota}\pi\tau\omega$. But $\rho\acute{\iota}\psi$ is also rightly compared with Lat. *scirpus*; whilst (in art. on $\epsilon\rho\acute{\epsilon}\iota\pi\omega$) $\rho\acute{\iota}\pi\tau\omega$ is treated as cognate with $\epsilon\rho\acute{\epsilon}\pi\omega$, which (cf. $\kappa\alpha\lambda\alpha\upsilon\rho\psi$) originally had initial v . These statements are inconsistent.

64. $\sigma\acute{\alpha}\lambda\omicron\varsigma$ s. v. is said to be connected with *salio*, *salax*, and to be perhaps akin also to $\zeta\acute{\alpha}\lambda\eta$, $\zeta\acute{\alpha}\lambda\omicron\varsigma$; and from the name of Curtius at the end of the note, it might be supposed that these statements were supported by his authority. The truth is, that for $\acute{\alpha}\lambda\lambda\omicron\mu\alpha\iota$ (= *salio*), $\zeta\acute{\alpha}\lambda\eta$, and $\sigma\acute{\alpha}\lambda\omicron\varsigma$, Curtius assigns three different roots: $\acute{\alpha}\lambda$ (= *sal*), $\zeta\alpha\varsigma$, and $\sigma\phi\alpha$. Indeed L. and S. themselves give, in their articles on $\acute{\alpha}\lambda\lambda\omicron\mu\alpha\iota$ and $\zeta\acute{\alpha}\lambda\omicron\varsigma$, $\acute{\alpha}\lambda$ and $\zeta\alpha$ as respectively the roots of these words.

65. $\sigma\acute{\alpha}\tau\tau\omega$. With this word 'Germ. *Satten*, our *saddle*,' are compared. But the Greek root contained a guttural, cf. $\sigma\alpha\gamma\acute{\eta}$, and the suggested affinity is imaginary.

66. $\sigma\epsilon\mu\acute{\nu}\omicron\varsigma$, $\sigma\epsilon\pi\tau\acute{o}\varsigma$ are said to come from $\sigma\acute{\epsilon}\beta\omega$, 'through p. pass. $\sigma\acute{\epsilon}\sigma\epsilon\mu\mu\alpha\iota$, $\sigma\acute{\epsilon}\sigma\epsilon\pi\tau\alpha\iota$, which however is not in use.' This is quite wrong. I will not dwell on the change of $\sigma\epsilon\beta$ to $\sigma\epsilon\mu$, though μ for β before μ in the perfect (if that tense existed) could not explain the change of β to μ before ν in the adjective. But to derive $\sigma\epsilon\pi\tau\acute{o}\varsigma$ from the perf. pass. of $\sigma\acute{\epsilon}\beta\omega$ is the same error as to derive $\delta\mu\mu\alpha$ from $\delta\mu\mu\alpha\iota$, instead of from the root $\delta\pi$ with the suffix $\mu\alpha$. $\Sigma\epsilon\beta\text{-}\tau\acute{o}\varsigma$, from root $\sigma\epsilon\beta$, becomes $\sigma\epsilon\pi\text{-}\tau\acute{o}\varsigma$ by an ordinary euphonic rule, and $\sigma\acute{\epsilon}\sigma\epsilon\beta\text{-}\tau\alpha\iota$ would, by the same rule, become $\sigma\acute{\epsilon}\text{-}\sigma\epsilon\pi\text{-}\tau\alpha\iota$; but $\sigma\epsilon\pi\tau\acute{o}\varsigma$ does not come *through* the perf. pass.

67. *σίμβλος* is said to be probably akin to *μέλι, βλίττω* : how this could be, it is not easy to understand.

68. *σμήνος* is said to be akin to *έσμός*, which is said *s. v.* to be 'prob. from *ΐημι*.' But if this latter derivation be correct, *-σμος* must be formative merely, as in *θε-σμός*, and *σμ* in *σμήνος* remains unexplained.

69. *σῆμα*. The etymologies, doubtfully suggested for this word, which connect it respectively with *θεάομαι* and with *τίθημι*, are inadmissible, because initial *θ* before a vowel is not changed to *σ* except in the Laconian dialect.

70. *σοβέω* is explained as meaning 'properly to say σου, σου (shoo! shoo!) to a bird,' which would make it onomatopoetic; but it is afterwards said to belong to the root [sic] *σένω*, akin to *φοβέω, φέβομαι*. How *σένω* (root *σν*) and *φέβομαι* can be connected does not appear; besides, *φέβομαι* is *s. v.* rightly compared with the Skr. *δही*, to fear, with which, surely, *σν* cannot be cognate.

71. *σπανίς*. This word is said to be akin to *ήπανία* and to *ήχάνω*. But *ήχάνω* is *s. v.* connected with *άχην* and with Lat. *egeo*; whilst *ήπανία* is compared with *πένομαι* (in the article on the latter word). These accounts are inconsistent, for *πένομαι* and *egeo* cannot be akin.

72. *σπείρα* is said to be akin to *είρω*; but the words are quite unconnected. The Lat. *sporta* (cf. *σπάρον, σπυρίς*) is correctly stated to be cognate with *σπείρα*: now *είρω* in Lat. is represented by *sero*. Will it be held that *sporta* and *sero* are akin?

73. *στρέφω* is said to have been 'originally the same word with *τρέπω*.' But this is not so; as is plain when we place side by side *στροβός, στροβέω*, from *στρέφω*, and *ωρ-queo*, which in Latin represents *τρέπω*. The *φ* of *στρέφω* corresponds to I. E. *dh*; the *π* of *τρέπω* to I. E. *k*.

74. *τέρας* is connected with *άστήρ* in the article on the latter word. The same etymology is repeated under *τέρας*,

but in that place is added, 'perhaps akin to *τέρμα*.' The root of *τέρμα*, however, has not initial *s*, and the affinities of the word are quite different from those of *ἀστήρ*. Both the statements respecting *τέρας*, therefore, cannot be right. The root of *ἀστήρ* is also wrongly said to be *ἀστρ-*; the stem is indeed *ἀστερ-*, but the root is *στερ*, I. E. *star*.

75. *τέρην* is (on *τρίβω*) connected with *τέρω*, *tero*, and also with *tener*. But in etymology, as in radical signification, *τέρην* and *tener* stand apart from each other. Whilst the former goes with *τέρω*, *tero*, the latter is akin to *tenuis*, *tendo*, *τέλω*.

76. *τηρός* is compared with Lat. '*tuer-i*' [sic]. But the *-eri* in *tueri* is formative, not radical; and *tuor* is found beside *tueor*. This comparison, therefore, cannot be sustained.

77. *τίκτω* (root *τεκ*) is s. v. compared with Engl. *get*. But this connexion is phonologically impossible; and, indeed, *get* is, in the article on *χανδάνω*, rightly compared with that word and with the Latin *hendo* (in *præhendo*).

78. *τραχύς* is s. v. said to be 'akin to *ράσσω*, *ρήσσω*, *ράχος*, etc.' But it has really no connexion with those words. In the article on *ταράσσω* it is rightly said to be akin to that verb: cf. the form *τέ-τρηχ-α*.

79. *τριζω*. With this word the Lat. *strideo* is compared; but they cannot be cognate, for, as the perf. *τέρτριγα* shows, the root of the Greek verb is *τριγ*.

80. *τρίηρης* is s. v. derived from *τρίς*, *ἐπέσσω*; but it is said to mean 'properly, *triply-furnished*,' which would imply a connexion not with *ἐπέσσω*, but with *ἀραρίσκω*; and from the latter verb it is accordingly derived in the article on *κατήρης*. Both accounts cannot be right.

81. *τύραις*. Of this word it is said that it is 'by some thought to be akin to *θύρσος*.' But that is contrary to phonological law, as *τ* cannot take the place of initial *θ* before a vowel. Besides *θύρσος* is said to be 'probably

from *θύω*, the symbol of Bacchic frenzy'; the name, therefore, on that supposition as to its origin, will imply the use, not the form, of the object; and *τύρσις* could not come from the same root.

82. *ύμήν* is said to be 'perhaps akin to *ύφ-ή*, *ύφ-αίνω*, Lat. *suo*.' But Lat. *suo* is altogether unconnected with *ύφ-ή*. This indeed appears in the article on the latter word, where the root of *ύφή* is rightly stated to be *ύφ-*, and its affinities with O. H. G. *wēb-an*, Engl. *weave*, are (after Curtius) pointed out; whilst, on the other hand, the relations of *suo* (Engl. *sew*) are rightly given in the article on *κασσύω*.

83. *ύπνος*. The root is said (perhaps by an error of the press) to be *ύπν-*. It ought, of course, to be *ύπ = snar*; cf. *sop-or*.

84. *φάρω*. It is said that from the future of this word comes *φάρσος*, Lat. *pars*. That any noun can be derived from the future of a verb is an exploded absurdity: in *φάρσος*, if it be referred to a verb *φάρω*, the *σος* must be suffix, added to the root *φap*. *Par(t)s*, in spite of Buttmann, Lexil., cannot be connected with *φάρσος*, Lat. *p* not representing Gk. *φ*; it goes with *portio*, and belongs to the same Indo-European root as Gk. *πορ* in *επορον*. The root of *φάρσος* is found in the Lat. *for-are*, and Engl. *bore*. It is also wrongly said in the article that *φάρω* is cognate with *πείρω*: the affinities of the latter word are quite different.

85. *φαῦλος* is, contrary to phonological laws, compared with *paullum*. The latter word is cognate with *pau-cus* and with Gr. *παῦ-ρος*; perhaps, as Curtius thinks, with *παύω*; but has nothing to do with *φαῦ-λος*, *φλαῦ-ρος*.

86. *φάω* is said to be the 'root' of *φαίνω*; this error in terminology often recurs: the root of *φαίνω* is *φα*, *φαν*.

87. *φεύγω* is s. v. rightly compared with Skr. *dhug*; but, on *σοβέω*, it is said to be akin to *φείβομαι*, which is, s. v., com-

pared with Skr. *bhī*. *Φεύγω* is also, on *σοβέω*, said to be akin to *σεύω*!

88. *φοξός* is s. v. said to be from *όξύς*; but *όξύς* is s. v. said to be 'probably not akin to *φοξός*.' The latter statement is the correct one. This erroneous comparison with *όξύς* I mentioned in my previous article; but I had not then noticed the *inconsistency* here pointed out.

89. *φόρμιγξ*. Of this word two erroneous accounts are given, whilst the quite unobjectionable one, which connects it with *βρέμω* (see Pindar, *Nem.* xi. 7), Lat. *fremo*, from an I.-E. *bhram*, though given by Curtius, is omitted.

90. *φρήν* is strangely connected with *φράσσω*, the root of which is *φρακ*; and the Lat. *renes* is represented to be akin to *frenum*, which again is made to be cognate with *φράσσω*. Not one of these comparisons can be sustained.

91. *φύρ* and Lat. *fur* are s. v. connected with 'Skt. *chur*.' They are really akin to *φέρω*, and are to be traced back to I.-E. and Skr. *bhar*.

92. *φώς* is said to be 'perhaps from *φάω*, *φημί*, one who has the gift of speech.' The word (stem *φωτ-*) is almost certainly cognate with the Skr. *bhavat*, from *bhī*, to be.

93. *χάζομαι* is said to be 'lengthened from the root *χαδ-*, *χα-*, connected probably both with *χάος*, *χάσκω*, and with *χανδάνω*.' But *χανδάνω*, we are told in the article on that word, 'seems to belong not to the same root as *χάσκω*.' These statements are inconsistent; the latter of the two is correct. *Χάος*, *χάσκω* are from the root *χα*, 'to gape, be empty,' with which the Lat. *hi-o*, *hi-sco* are cognate; whilst *χανδάνω* is from the quite different root *χαδ*, to hold, contain, which is represented in the Lat. *prae-hendo* and the Engl. *get*. With neither of these roots has *χάζομαι*, apparently, anything to do.

94. *χείρ*. With this word *ἀρπάζω* is compared. But they are not cognate; the root of the latter is the same with that of the Lat. *rap-io*, while *χείρ* is related to Skr.

har, 'to seize.' In the same article αἰρέω and ἀγρέω are compared with each other, but there is every reason to believe that they are unconnected: see Curt. No. 117.

95. χεύω is (letter υ) said to have arisen from χέω, by insertion of υ. But this misrepresents the fact. The root is χυ (cf. χυ-τός, χύ-δην), whence χέω, and from this last, by loss of the digamma, χέω, or by its vocalization, χεύω.

96. χορός. This word, it is said, 'may be akin to *curvus*.' But initial χ is not represented by *c* in Latin; and *curvus* plainly goes with κυρός and κίρκος.

97. χρόμαδος is said to be onomatopoetic. But it is surely regularly formed from χρεμ in χρεμ-ερίζω, χρέμ-πτομαι, whether the latter be onomatopoetic or not. The latter word *appears* to be viewed as etymologically akin to *scree*: if so, this is an error; the Latin word is of quite different origin.

98. ὥρα is said to be 'akin to Lat. *cura*,' which is phonetically impossible. The true relations of ὥρα, which connect it with ὀραώ and *vereor*, are given (from Curtius) on οὔρος.

To complete a 'century' of criticisms, I will add the two following, which do not relate to etymology, but to interpretation and prosody respectively:—

1. φέρτατος. On this word, κακῶν φέρτατον, Hom. *Il.* 17, 105, is explained as if it meant 'greatest of evils'; whereas it really means 'the best, most eligible, of evils,' between which one is forced to choose.

2. κατάβα, Att. 2 aor. imper. of καταβαίνω, is marked κατάβαῖ. But ἔμβα is marked ἔμβᾱ, and rightly, v. *Ar. Ran.* 377. Κατάβα, therefore, has the final *a* long; and Tate quite correctly quotes the line, *Vesp.* 979,

κατάβα, κατάβα, κατάβα, κατάβα. καταβήσομαι,

to show that the Comic Trimeter Iambic admits an anapaest in every place but the last.

J. K. INGRAM.

MYERS' PINDAR.

MR. MYERS' translation was recently read over to me, while I held the original, and marked what I considered its inaccuracies. It is barely just to say that, in spirit and style, Mr. Myers' version is of the highest order. In the following notes his renderings are given in italics :—

O. i. 1.

ἄριστον μὲν ὕδωρ.

Best is water of all; rather, with reference to Thales, and, in physiological language, prepotent. ἄριστον, cf. ἀριστεία, ἀριστεία, suggested to a Greek ἄρης, 'struggle.' The same notion appears in Aristotle, e. g. Κάκιστος μὲν οὖν ὁ πρὸς αὐτὸν καὶ πρὸς τοῦς φίλους χρώμενος τῇ μοχθηρίᾳ ἄριστος δ' οὐχ ὁ πρὸς αὐτὸν τῇ ἀρετῇ, ἀλλ' ὁ πρὸς ἕτερον τοῦτο γὰρ ἔργον χαλεπόν.—E. N. v. i. 18. 'Water is paramount.'

Ibid. 12, 13.

ὅθεν ὁ πολύφατος ὕμνος ἀμφιβάλλεται
σοφῶν μητίεσι, κελαδεῖν.

Entereth into the minds of the skilled in song; rather, 'preludes, strikes its first chord in the poet's soul'; hence the propriety of κελαδεῖν, 'to peal out in swells of praise.'

O. ii. 41.

ὀξεῖ' Ἐριννὺς.

Fierce; rather, 'swift': cf. ὀξύχει, Aesch. *Cho.* 23.

Ibid. 65.

κεινὰν παρὰ δάιταν.

In that new world, reading κείναν, as in ἐκεῖ: rather, 'for our thin fare,' reading as above, from κενός.

They pluck them no dead flowers,

Nor thirst for streams that fail.

O. iii. 8.

ἐπέων τε θέσιν.

Ordering of words; rather, 'rhythm of verse,' in reference to the ictuation of the line—θέσις.

O. iv. 1.ἐλατῆρ ὑπέρτατε βροντᾶς
ἀκαμαντόποδος Ζεῦ.*Hurler of thunderbolts unfaltering*: rather, 'that driveth the thunder.' The thunder-cloud drives against the wind, and so appears driven before it; cf. *Childe Harold*, iv. 98:'Yet, Freedom! yet thy banner, torn, but flying,
Streams like a thunder-storm against the wind.'

O. vi. 31.

κρύψε δὲ παρθενίαν ὠδῖνα κόλποις.

Her maiden travail she hid by her robes' fold: rather, a periphrasis for first conception; ὠδῖς is the pain, and the fetus that causes it; cf. Aesch. *Ag.* 1348:

παῖδα φιλάττην ἐμοὶ
ὠδὶν' ;

κόλποις = the hollow, the submammary region; and κρύψει = covered up, stored; cf.

ὥς δ' ὅτε τις δαλὸν σποδιῇ ἐνέκρυψε μελαίνην. ε 448

Callimachus does use κόλποι 'of the womb':

ἐνθά σ' ἐπεὶ μήτηρ μεγάλων ἀπεθήκατο κόλπων. J 15

The order of the narrative proves this. So also in *Dian.* 25. Curtius connects the word with O. N. *hvalf* = vault. In Greek it certainly means a curve, either convex or concave, of body, dress, land, or water, like *sinus*.

O. vi. 91.

σκυτάλα Μοισῶν, γλυκὺς κρατῆρ.

Writing tally. The word *per se* implies writing; but the metaphor is the other way; the messenger is the vehicle; as the scytale is of writing, and the bowl is of liquor.

O. viii. 71.

εἰ δ' ἐγὼ Μελισία ἐξ ἀγενείων κῦδος ἀνέδραμον ὕμνῳ.

If I for Melesias raise up glory in my song of his boys.
ἀνέδραμον is better intransitive, ἀνὰ, like *re*, denoting

change or restriction; if I fell back on, as opposed to going on = if I dwelt on. As to the tense here and in N. vii. 75, the 2nd aorist contains the stem in its most rudimentary form, and is therefore adapted to express hypothesis in its least permanent phase. It is perhaps best rendered by the English subjunctive present: 'if I dwell on.' But the Greek indicative does more than this—it depicts the hypothesis as actualised in the writer's mind. Translation is utterly misleading. The Greek moods and tenses were not made with reference to other languages, and to criticise Greek syntax from the point of view of a modern language is, to borrow a comparison, mending a watch with a pickaxe. The difficulty is, the mood—the indicative—excludes supposition merely mental; and the tense—the aorist—excludes futurity, and yet in sense it represents a future of a supposition, and so far the Scholiast and Dissen are right. The scholar looks only at what is written; the philosopher may argue it comes to the same thing in the end; but the question in all such cases is, not what it is in the end, but what it is in the beginning; and it is so in the beginning, because a great writer differentiates his ideas, and does not write for translators.

O. xi. 9, 10.

ἔκαθεν γὰρ ἐπελθὼν ὁ μέλλων χρόνος
ἐμὸν καταλίσχυνε βαθὺ χρόος.

For from afar hath overtaken me the time that was then yet to come. A metaphor from Contract: ὁ μέλλων χρόνος the time for the obligation to run before it falls due—*dies cedit*, ἐπελθὼν on 'maturity'—*dies venit*.

O. xiii. 40.

δέξαι δέ οἱ.

Welcome for him; rather, 'receive from him,' δέχομαι in Homer and Pindar taking the dative: δέξατό οἱ σκῆπτρον.— B. 186.

P. i. 20.

χιόνος ὀξείας.

Her dazzling snow; rather, in reference to the spiky crystallization of freezing.

P. ii. 20.

δρακεῖω' ἀσφαλές.

So that her eyes are not afraid for anything; 'with confidence in her look.' The aorist participle proves this.

Ibid. 34.

Διὸς ἄκοιτιν ἐπειράτο.

He tempted the wife of Zeus; rather, 'he attempted.'

P. iii. 55.

χρυσὸς ἐν χερσὶν φανείς.

Gold in his hands glittering; rather, 'ready money;' he could not resist gold when proffered, though he might have

rejected the mere offer of it, φανείας, on its being shown him. φαίνω always refers to sensible manifestation, and is nearly always misunderstood.

P. iv. 98, 99.

τίς ἀνθρώπων σε χαμαιγενέων πολιᾶς
ἐξανήκε γαστρὸς.

Who of earth-born mortals bore thee of her womb out of due time? rather, 'what churl begat thee in his dotage?' Πολιᾶς γαστρὸς used as vaguely as *his father's loins*: as to π. γ., cf. *Alc.* 42. 2:

καττῷ πολίῳ στήθεος.

Γαστήρ is used of the two sexes by Archilochus:

κάπὶ γαστρὶ γαστέρα προσβαλεῖν,

fr. 72. 1, 2; this passage, it is curious, contains the oracular word ἀσκὸς, but applied to the female, and not to the male, as in the *Medea*.

P. v. 78.

καπνωθεῖσαν πάτραν ἐπεὶ ἴδον.

Their native city smoking; 'reduced to smoke,' aorist, not present.

P. vii. 6, 7.

ἐπιφανέστερον
Ἑλλάδι πυθέσθαι.

More glorious throughout H.; rather, 'for H. to hear.'

P. x. 62.

τῶν δ' ἕκαστος ὁρούει,
τυχῶν κεν, ἀρπαλέαν σχέθαι φροντίδα τὰν παρ ποδός.

Yet each, if he attain to the thing he striveth for, will hold his eager desire for the time present to him. The sense is: attainment, if immediate, is desirable; if deferred, may not be so.

N. i. 1.

ἄμπνευμα σεμνὸν Ἀλφειῶ.

Resting-place; rather, 'where Alpheus jets up.' The spouting of a whale is the exact notion of ἄμπνευμα.

Ibid. 58.

παλίγλωσσον.

False; rather, 'reversed': 'the child killed the snakes,' in place of 'the snakes killing the child.'

N. iii. 28.

Αἰακῷ σε φαμὶ γένει Μοῦσαν φέerein.

I charge thee bring; rather, 'tell thee,' *i.e.* 'remind you.'

Ibid. 82.

Κραγέται δὲ κολοιοὶ ταπεινὰ νέμονται.

In low places dwell the chattering daws; rather, 'prey on garbage,' 'peck at lowly things.'

N. iv. 15.

τῷδε μέλει κλιθεῖς.

Would he have bent him unto this my theme? rather, 'absorbed in.' Κεκλιμένος, in Homer, seems to mean 'having as a background for support': e.g. ἀσπίσι, ἥερι, &c. In Trach. 100, δισσαῖσιν ἀπείροις κλιθεῖς = 'having the two mainlands as a field for his errantry,' 'having two continents to fall back on.'

N. iv. 17.

ἐνθα Τεῦκρος ἀπάρχει.

Holdeth rule in a new land. The word also suggests that Teucer enjoys his new far realm. Conington has pointed out that a word may suggest different meanings.

N. iv. 45.

Λυδία σὺν ἁρμονίᾳ.

With Lydian harmony. σὺν, as in σὺν ἐλαίῳ, P. iv. 221, and Cato's *cum*, denotes the base or main ingredient of the compound.

N. v. 16, 17.

οὗτοι ἅπαντα κερδίων

φαίνουσα πρόσωπον ἀλάβει' ἀτρεκής.

Not for every perfect truth is it best that it discover its face; rather, 'the truth in its entire extent in distinctness.' ἅπας denotes the aggregate of the parts; πᾶς, each one of them; οἱ πάντες, every one of the items.

N. vii. 36.

τῇ καὶ Δαναοὶ πόνησαν.

Where the Danaï toiled with him; also, 'were sore distressed.'

Ibid. 56.

εὐδαιμονίαν ἄπασαν.

Every kind of bliss; rather, 'bliss completed.'

N. ix. 2.

ἐνθ' ἀναπεπταμένοι ξείνων νενίκανται θύραι.

Where doors are opened wide to greet the invading guests; rather, 'are too narrow for the thronging guests.'

N. x. 29, 30.

Ζεῦ πάτερ, τῶν μὲν ἔραται φρενὶ σιγᾷ οἱ στόμα· πᾶν δὲ τέλος
ἐν τιν ἔργων· οὐδ' ἀμόχθῃ καρδίᾳ, προσφέρων τόλμαν, παραιτεῖται
Χάριν.

Of that he longeth for, O father Zeus, his mouth is silent; with thee are the issues of deeds; but with a spirit strong to labour, and of a good courage, he prayeth thy grace. Παραιτέομαι, in Æschylus, is always asking for; παρὰ, perhaps, giving it the sense of begging; so I am inclined to prefer Mr. Myers' version to Donaldson's, pointing out that προσφέρων τόλμαν gives the reason why he does not shrink from toil.

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N. 10. 61.

δρυὸς ἐν στελέχει.

Beneath an oak-stump; rather, 'on it.'

Ibid. 71.

ψολοέντα κεραυνόν.

Consuming fire; rather, 'lurid': cf. the mock-thunder of Salmoneus, 'nec fumea taedis lumina,' Aen. vi. 593. Here the bolt is ψολοείς, as emerging from 'media nimborum nocte.'

N. xi. 48.

ἀπροσίκτων ἐρώτων.

Unappeaseable desires; rather, 'unattainable.'

I. i. 4.

ἐν ᾧ κέχυμαι.

To which I am vowed; rather, 'to which I am all given,' as liquid diffuses itself over a surface.

I. ii. 21, 22.

χεῖρα . . .

τὸν Νικόμαχος κατὰ καιρὸν νείμ' ἀπάσαις.

The hand wherewith in the moment of need he bore on all the reins; rather, 'he adjusted to the exigency':—

foedere certo
et premere, et laxas sciret dare iussus habenas.

I. iii. 54.

μομφὰν ἔχει.

He upbraideth; rather, 'brings reproach on.'

Ibid. 74.

πολιᾶς ἀλὸς ἐξευρὼν θέναρ.

Searched out the surface; rather, 'when he had discovered the ledge, boundary.' (See Curtius.) 'Pillars of Hercules.'

Ibid. 84.

αἰθέρα κνισσᾶντι λακτίζουσα καπνῷ.

Savoury smoke hurling itself against the upper air; λακτίζουσα, 'puffing at irregular intervals,' like Shakespeare's 'lazy-puffing clouds' (an epithet sometimes unnecessarily altered by the editors).

I. iv. 44, 45.

τετείχισται δὲ πάλαι

πύργος ὑψηλαῖς ἀρεταῖς ἀναβαίνειν.

A tower is she, builded, from long ago, to tempt the climb of high adventuring valour. The logic of the passage is, 'Virtue seeks fame—elevation—πύργος, and Ægina is the place where Virtue finds proper elevation for her Valour to mount high.'

Ibid. 57, 58.

οὐδ' ὀπόσαι δαπάναι
ἐλπιδων ἔκνισ' ὅπιν.

*Nor was ever their zeal abated by any counting of the cost ;
rather, ' nor did the outlay excite regret.'*

Ibid. 48.

καὶ νῦν ἐν Ἀρεί.

*And even but now ; ' so now,' the instance of the general
statement.*

I. v. 45, 46.

λίσσομαι παῖδα θρασὺν ἐξ Εριβοίας
ἄνδρι τῷδε ξείνον ἄμυν μοιρίδιον τελέσαι.

*I pray thee that thou give this man a brave child of Eriboia's
womb, that by award of fate my friend may gain a son ;
rather, ' a brave child who will be our ξένος by receiving
my ξεινήϊον, the wrapping of the lion-skin, to fulfil his
destiny': to wit, woundlessness and lion-heartedness.
The simplest construction would be, λίσσομαι σε τελέσαι
παῖδα μοιρίδιον : ' I pray to bring to maturity for Telamon
a boy for our gift, according to destiny, to be invulnerable
and lion-hearted.'*

THEOCRITEA,

ii. 101.

κηφ', ὅτι Σιμαίθα τυ καλεῖ, καὶ ὑφέγεο τῷδε.

If with Wordsworth and Paley we make τυ orthotone, the meaning is 'you (τὸ) are called Simaetha'; but it obviously means 'Simaetha wants you (τυ).' If so, τυ is the accusative, and therefore enclitic.

vii. 111, 112.

εἷς δ' Ἡδωνῶν μὲν ἐν ἄρεσι χεῖματι μέσση
Ἔβρον παρ ποταμὸν τετραμμένος ἐγγύθεν Ἄρκτου.

Τετραμμένος, unless in the sense of *versari*, is vague; perhaps the reading should be, τεθραμμένος, 'the blood curdled with cold.' Cf.—

στακέεσσι περιτρέφετο κρυστάλλος; ξ, 477

and 'thaws the jellied blood of age.'

xxx. 28, 29.

καὶ νῦν, εἴτ' ἐθέλω, χρή με μακρὸν σχόντα τὸν ἄμφενα
ἑλκην τὸν ζυγόν, εἴτ' οὐκ ἐθέλω.

Wordsworth and Paley, edd. 2, both take μακρὸν σχόντα τὸν ἄμφενα = ὑψαύχενα, 'the high head of the mettled horse—me, who formerly, but not now, carried my head so high.' But it plainly refers to the weedy neck of the jaded hack strained in draught. Cf.—

Contenta cervice trahunt stridentia plaustra.

T. MAGUIRE.

EMENDATIONS IN PLAUTUS, CATULLUS, AND HORACE.

PLAUTUS.

Amphitruo, 1051.

BLEPHARO. Vos inter vos partite; ego abeo, mihi negotium est.

Read—

Vos intèr vos *vos* partite.

Blepharo says he cannot decide which is the real Amphitryon, and bids the pair divide *themselves* between themselves. 'Partite *istaec*,' Ussing's reading with late MSS. has no meaning.

Asinaria, 202.

Semper oculatae manus sunt nostrae, credunt quod vident.

Vetus est nihili † coactiost scis cuius non dico amplius.

Ussing reads '*coactio*,' supposing there was a proverb to the effect that the scraping together of refuse, or worse, was useless. Admitting that there may have been such a proverb, I do not see what point it could have here. Cleareta says she does not give credit, and introduces part of a proverb which she, from motives of delicacy, refrains from completing. I agree with those who suppose the true reading to be *cautio*, and *mendici* may well have been the word wanting to complete the proverb: 'a beggar's bond is useless.' Whatever the missing word was, it most probably was one that would fit metrically into the place of *scis cuius*, which, unexpected by the audience, are given instead of the familiar word.

Asinaria, 532.

Non voto ted amare qui dant, qua amentur gratia.

‘Post *qua* hiatus admodum molestus’ (Ussing). The correction is simple:—

Non voto ted amare qui *quidem* dant qua amentur gratia.

Quidem greatly improves the sense, and easily fell out. *Quid* would also be a plausible proposal.

Asinaria, 862.

ARTEMONA. Ego censeo

Eum etiam hominem in senatu dare operam aut cluentibus
Ibi labore delassatum noctem totam stertere.

I propose to read—

Ego censeo

CENSERE eum etiam in senatu dare operam aut cluentibus.

Artemona thinks her husband is engaged at his senatorial duties, or with the affairs of his clients. *Censere in senatu* was a regular phrase, and Artemona, probably, purposely chose *censeo* to contrast her ruminations at home with those of her husband in the senate.

Bacchides, 49.

Quia enim intellego,

Duae unum expetitis palumbem : perii harundo alas verberat.

The second verse is too long. Some leave out *alas*, as a gloss. Perhaps *perii* is corrupt. The exclamation comes in very awkwardly. I am inclined to think that ‘*pertica* alas verberat’ is the true reading : cf. *Asinaria*, iii. 2. 43, ‘Nimis

vellem habere *perticam* . . . qui *verberarem* asinos.' *Harundo*, as the more usual word for the pole with which birds were caught, may have been an explanatory gloss on *pertica*.

Bacchides, 103.

BACCHIS A. Aqua calet ; intro eamus, ut laves ;
 Nam ut in navi vecta es, credo timida es. BACCHIS S. Ali-
 quantum soror.

†Simul huic nescio qui turbare qui huc it decedamus.

BACCHIS A. Sequere hac igitur me intro in lectum ut sedes
 lassitudinem.

The obelised line is rejected by Ussing. It probably, however, is only corrupt, not spurious. I think Bacchis says she has a confused sensation in her head after her sea voyage, a whirling vertigo. This might be expressed by the word *turbo*. Curiously Ovid joins *nescio quis* with *turbo* in a metaphorical sense, *Am.* ii. 9. 28 : 'Nescio quo miserae turbine mentis agor.' I think a verse of this sort is wanted :—

Simul hic nescio qui turbo requiem nunc desiderat ;
 or, reading *turbæ*—

Simul huic nescio quoi turbæ requiem nunc decet dari.

Bacchides, 138.

Non par videtur neque sit consentaneum
 Quom haec intus sit et cum amica adcubet
 Quomque osculetur et convivæ alii adcubent
 Praesens ibi ullus paedagogus ut siet.

Read—

Quom cenet intus et cum amica *amans* cubet.

Amans dropped out after *amica* : cf. 191, *infra*, 'Animast amica amanti.' *Adcubet* comes from the next line.

Bacchides, 232.

Ibo in Piraeum ; visam ecquae advenerit
In portum ex Epheso navis mercatoria.

Read *devenerit*, a common Plautine word, and there will be no hiatus. *Devenerit*: 'has come to port,' like *κατάγεισθαι*; so *deveniat domum* (*κατελθεῖν*), *Miles*, 1103.

Bacchides, 275.

Forte ut adsedi in stega,
Dum circumspecto atque ego lembum conspikor.
[Longum est, rigorem maleficum exornarier.]

So the passage is printed in Weise's edition. The last line is condemned by him as devoid of meaning, and Lambinus's explanation of it is certainly not probable. The emendation is, however, easy; and I daresay has ere this been made by some other critic. Read

atque ego lembum conspikor
Longum, **TRIEMEM**, maleficum exornarier.

'I saw a long, three-banked, rascally, piratical galley being got ready for sea.' The *t* of *trirem* became united to *longum*, giving rise to *longumst*:—*rirem* lost one-*em*, and became *rirem*, corrected to *rigorem*. The ships of war in ancient times were long (*μακραί*), opposed to the tubby merchant vessels (*στρογγύλαι*). Ussing reads *trygonem*, from Gertz's emendation, comparing the galley to the *sting-ray*.

Bacchides, 381.

De me hanc culpam demolibor et seni faciam palam,
 Ut eum ex lutulento coeno propere hic eliciat foras.

The second line is unmetrical. Ussing supplies *ille* before *eum*. Better, I think, to read—

Ut *svem* ex lutulento coeno propere hinc eliciat foras.

Compare Horace, Ep. i. 2. 26: 'Vixisset canis immundus
 vel amica *luto sus*.'

Bacchides, 389.

Condigne is quam technam de auro advorsum meum fecit patrem,
 Ut mihi amanti copia esset. . . .

Ussing agrees with previous editors in omitting the certainly spurious words *sed eccum video incedere*, which are here inserted in the MSS., taken from the end of v. 400. The editors since Muretus are, I think, mistaken as to the general sense of the original words. Surely *quam technam fecit* require something like *enarravit ordine* to follow. A line has probably dropped out before 391.

Bacchides, 425.

Ibi cursu, luctando, hasta, disco, pugilatu, pila,
 Saliundo sese exercebant magis quam scorto aut sauiis.

Read *cursura*, to avoid hiatus: cf. *supra*, 65: 'Ubi pro
disco damnum capiam, pro *cursura* dedecus.'

Captivi, 10-14.

Iam hoc tenetis ? optimumst.

Negat hercle ille ultimus. Accedito.

Si non ubi sedeas locus est, est ubi ambules,

Quando histrionem cogis mendicari.

Ego me tua causa, ne erres, non rupturus sum.

Ussing, for the eleventh verse, reads—

Negat hercle ille ultimus. *Tu vero* abscedito.

But what follows shows that what the distant spectator complains of is, that he could not hear what was said. The actor says he is not going to crack his voice for him. Read—

Negat hercle ille ultimus EXAUDIRE. Accedito.

He says he cannot hear where he is. *Exaudire* is the proper word for hearing at a distance, and not very unlikely to drop out before *accedito*. Cicero in one of his speeches, Sull. i. 33, says he does, and will continue to do, what the actor here refuses to do: '*maxima voce ut omnes exaudire possint, dico semperque dicam.*'

Captivi, 273.

Eugepae ! Thalem talento non emam Milesium ;

Nam ad sapientiam huius *ille* nimius nugator fuit.

So Ussing. But it will strike the reader that *talento* must be wrong. What Tyndarus means to say is, 'he would not now give the merest trifle to own Thales ;

his own slave surpasses Thales in wisdom.' It is always a most contemptible trifle that is used in such cases. Cf. *Casina*, ii. 5. 38:—

OL. Quid si sors aliter, quam voles, evenerit?

ST. Benedice! dis sum fretus; deos sperabimus.

OL. Non ego istuc verbum empsim titivillitio.

Festus explains *titivillitium* as a word of no meaning, comparing it with the Greek βλίτυρι, σκινδαψός. Fulgentius explains it as meaning 'rotten threads that fall from the loom.' In *Poenulus*, i. 2. 64, occurs:

Monstrum mulieris! tantilla tanta verba funditat

Quoius ego nebulae cyatho septem noctes non emam.

'A glass of fog.' This is the Vulgate, I know not on what MS. authority based. The older copies had *obulo aerato*, which may stand for *obolo uno aerato*, 'one brass farthing.' At any rate the thing meant is a valueless trifle.

In the passage before us, then, we must substitute for *talento* something much less valuable. The manuscripts do not give much assistance, as B, a collation of which manuscript alone is given by Ussing in his edition, gives *Eugēpetale tantento*. *Tale* here, I suppose, stands for *Thalē*: we are, therefore, left with *tantento* to work on. *tanle* is palaeographically nearly equal to *caule*. We might, therefore, suggest *Thalem* CAVLE UNO, 'I would not give one cabbage stalk for Thales.' The first conjecture that occurred to me was to read *Thaleta*, or *Thaletem* LENTE, 'I would not give a lentil for Thales,' a conjecture which also occurred to Professor Tyrrell on my suggesting to him the incongruity of the ordinary reading. I also thought of *Thaletem* TALLA. *Talla* means the coat or peel of an onion (κρομμύου λέπυρον), and is used by Lucilius. *Thalem* is the form of the accusative used by Plautus, but there is no reason why he should not have said either *Thalem*,

Thaletem, or *Thaleta*. He changes at will in the *Mostellaria* from *Philolachem* to *Philolachetem*. Vergil uses both *Daren* and *Dareta*.

Curculio, 603, *seqq.*

PLANESIUM. Rogita, unde istunc habeat anulum.

Pater istum meus gestitavit. CURC. †At mea matertera.

PLAN. Mater ei utendum dederat. CURC. †Pater uo is risum tibi.

PLANESIUM. Nugas garris.

In the first place, we should read 'at mei matertera,' 'my father used to wear it,' says Planesium; 'but my father's aunt,' retorts Curculio. This is simpler than any of the proposed changes.

The correction of the third line is, I think, easy; although all the corrections that I have seen wander very far from the MS. reading which I print above.

We should read, I think, *Pater AVO: is rusum tibi*: 'My mother lent it to my father,' says Planesium. Curculio ironically retorts: 'and your father lent it to your grandfather; he in his turn passed it on to you.' To which nonsensical speech Planesium naturally replies, *Nugas garris*.

Menaechmi, 839.

MENAECHMUS. Haud male illanc amovi: nunc hunc inpurissimum Barbatum, tremulum Tithonum Cygno qui cluet patre, Ita mihi inperas, ut ego huius membra atque ossa atque artua Comminuam illo scipione, quem ipse habet?

A word has dropped out of the first verse. Read:

Haud male illanc amovi: nunc hunc HIRCVM inpurissimum Barbatum, *cel*.

Hircum very easily dropped out after *hunc*. The old man is compared to a goat above, 5. 2. 85:

Poste autem illic *hircus* olidus qui saepe aetate in sua
Perdidit civem innocentem falso testimonio.

Compare, also, *Casina*, 3. 2. 20:

Propter operam illius hirci improbi atque edentuli.

Menaechmi, 881.

SENEX. Magna cum cura ego illum curari volo.
MEDICUS. Quin † suspirabo plus sescenta in dies:
Ita ego illum cura magna curabo tibi.

Read:

Quin INSPVTABO plus sescenta ei in dies.

‘I’ll spit upon him a thousand times a day.’ *Insputabo* is, I think, *almost* proved to be the true reading by the corresponding passage in the *Captivi*:

ARISTOPHONTES. Ain, verbero,
Me rabiosum, atque insectatum esse hastis meum memoras patrem,
Et eum morbum mihi esse, ut qui me opus sit *insputarier*?
HEGIO. Ne verere, multos iste morbus homines macerat,
Quibus *insputari* saluti fuit, atque is profuit.

Sescenta would then be used adverbially, as in the phrase *sescenta tanta*; or *sescentos* may be read.

There is, however, another emendation possible, which I dare say will command more followers than *insputabo*. It is:

Quin SVBVS PIABO plus sescentis in dies.

‘I’ll lay his evil spirit with more than six hundred pigs every day.’ The sacrifice of a pig was supposed to assist

or effect a cure of insanity. The insane person was in such cases said *piari*. *Men.* ii. 2. 14 :

MĒN. Responde mihi,
Adulescens, quibus hic pretiis porci veneunt,
Sacres, sinceri ? CYL. Nummis. MĒN. Nummum a me accipe :
Iube te piari de mea pecunia.

So *Men.* iii. 2. 51 :

Aut te piari iubes, homo insanisume.

Piare is used in this sense in Festus, p. 213 (Müll.). The chief objection I had to this reading was an idea that *porcus*, *porca*, or *porculus* was the regular word used for the young pig (*bimestris*) slain in sacrifices : cf. Hor. *Od.*, iii. 17. 15 ; Ov. *Fast.* 6. 158 ; but Plautus makes *porculus* an equivoque for *sucula*, *Rud.* iv. 4. 126 :

P. Et sucula est. G. Quin dierecte i tu cum sucula et cum porculis.

It appears to me that this emendation derives very strong confirmation from an ingenious restoration of Professor Tyrrell's in his edition of the *Miles Gloriosus* lately published. The following unintelligible verses are found at 586, *seqq.*, of that play :

PR. Illic hinc abscessit. sat edepol certo scio
Occisam saepe sapere plus multo suem
* * * * *
Qui adeo admutilatur, ne id quod vidit viderit.

On this Professor Tyrrell writes : ' Can there be in the passage any allusion to the custom referred to in *Men.* ii. 2. 16, and testified to by Varro, R. R. 4. 16, of offering pigs to obtain the restoration of a sound mind. The

passage, with a slight modification of 587, would then have run somewhat thus :

sat edepol certo scio
 Occisa saepe sapere plus multo sue
Insanos : sed illine opus est plena hara suom
 Qui adeo admutilatur, ne id quod vidit viderit ?

“ I know that madmen often become much more sensible through the slaughter of a sow ; *but would not this fellow require a whole sty to be sacrificed for him*, since he is cajoled into not having seen what he actually has seen ” ?

This is perhaps the most brilliant emendation in a most charming book, attractive alike to the critic and the schoolboy. It will be especially welcomed by the latter as a safe guide in that *terra incognita* to schoolboys, Plautus. Professor Tyrrell has brought varied gifts to bear on his work, and if accuracy and brilliancy, industry and felicity, can create a book that will repay the perusal, this edition of the *Miles* is such a work. Professor Tyrrell's own resources are vast ; but he has also not spared the pains to find out and lay before the reader—a task of no mean difficulty—what the host of German miners into Plautine lore have been putting out during the past twenty years. I offer him the following few suggestions which have occurred to me during the perusal of his work :—

Miles, 222.

Coge in obsidium perduellis, nostris praesidium para.
 Interclue inimicis † conmeatum, † tibi moeni viam,
 Qua cibatus conmeatusque ad te et legiones tuas
 Tuto possit convenire.

The second line is corrupt in *conmeatum*, as is shown by the want of diæresis, and by the fact that *conmeatus* recurs

in the next line. To the many conjectures recorded by Professor Tyrrell I will add yet another :

Interclude inimicis semitam : at tibi moeni viam.

Via and *semita* are quite commonly joined together. I take the following from the Dictionary : 'non optimis viis, angustissimis semitis,' Cic. *Agr.* 2. 35, 96 ; 'omnibus viis notis semitisque essedarios ex silvis emittebat,' Caes. B. G. 5. 19 ; 'aut viam aut semitam monstret,' Plaut. *Rud.* i. 3. 30 ; 'decedam ego illi de via, de semita,' *Trin.* ii. 4. 80 ; 'iam intelligetis hanc pecuniam quae via modo visa est exire ab isto, eandem semita revertisse,' Cic. *Verr.* ii. 2. 23 ; 'illius ego semita feci viam,' Phaedr. 3 prol. 38. The proverbial line in Ennius (Ribbeck, *Trag.* 274) is especially apt :—

Qui sibi semitam non sapiunt, alteri monstrant viam.

It is true that *semitam* is not very like *commeatum*, but nothing at all resembling the latter word has been suggested. The sense is now good : 'Cut the enemy off even from the narrow path by which they get their supplies ; but construct a regular road for yourself.'

Miles, 690.

Verum prius quam galli cantent, quae me e somno suscitet,
Dicat : 'da mihi vir Kalendis meam qui matrem iuverim,
Da qui farcit, da qui condit : da quod dem quinquatribus
Praecantatrici, coniectrici, ariolae atque aruspicae :
Flagitiumst si nil mittetur, quae supercilio spicit.'

In the last line I would merely change *supercilio* to *supercilium* or *supercilia*, and the sense is perfect—'It's a shame,' says the begging wife, 'if we send no present to the woman who tells fortunes from the eye-brows.' Professor Tyrrell reluctantly admits the ordinary reading *quo supercilio spicit* into his text, although he puts forward this interpre-

tation of the MS. reading, which I have no doubt is the true one. There is, however, no reason to adopt his clever suggestion, *supercilia auspicat*. For *spicere* with an accusative was, we are told by Varro, the very form of expression used for divining by augury: 'in auguriis etiam nunc dicunt *avem specere*.' The eyebrow most likely held the place with ancient fortune-tellers which the palm of the hand holds with modern gypsies.

Miles, 883.

Ac. Postquam adbibere aures meae tuam moram orationis
Tibi dixi miles quemadmodum potisset deasciari.

Ritschl reads *loream* for *moram*: but *loream*, 'thin wine,' is open to many objections, and is rightly scouted by Professor Tyrrell, who reads *morium*: 'the moment my ears drank in a particle of your discourse.' I am unable to assent to this conjecture, and I confess I do not see what grave objection the obvious suggestion, *tuam moram orationem*, 'your foolish harangue,' is open to. *Morus*, 'foolish,' occurs repeatedly in the *Miles*. The corruption, *orationis*, is easily accounted for by supposing the copyist to have taken *moram* for the noun, and to have thought the meaning required was 'the delay of your discourse.' The next line seems to me to imply that the harangue of Periplectomenus was foolish; he had apparently made some foolish proposal, and Acroteleutium had pointed out the real way of carrying out their design. *Rorem* would, I think, be as good as any conjecture that allows *orationis* to stand.

Miles, 893.

Ac. Dum ne scientes quid bonum faciamus ne formida.

Pe. Mala mulier mers est * * * * *

* * * * * ne pauē, peioribus conveniunt.

Pe. Ita vos decet.

So Professor Tyrrell, marking a lacuna with Ritschl, and reading *mers* (*merx*) with Brix. But I do not think there is any lacuna, and the MSS. scarcely point to *mers*. B has *mala mulier est ne pavet peioribus conveniunt*. Hence we might read, with scarcely any change, giving the words to Acroteleutium—

Malae mulieres, ne pave, peioribus conveniunt.

I say with scarcely any change, for Professor Tyrrell has pointed out the habit in the Plautine MSS. of introducing paragogic *t*, so as to make words like *venisse* become *venisset*. Here I merely change *mala* to *malae*, the division of *mulieres* into *mulier es* having caused *malae* to be altered to *mala*, so as to agree with *mulier*, and drop two of the afore-said *t*'s. I have no doubt whatever that the verse began with *Malae mulieres*. We might then render the line, 'Don't be afraid, bad women are well suited to dealing with worse characters.' But this is not very good sense, and so I am disposed to believe there is a further corruption in *conveniunt*. Now, turn on to verse 1218. Mistress Fagend says:—

Video. Edepol nunc nos tempus est malas fieri peiores.

'Now's the time for us bad women to become worse.' In this verse she seems to me to be distinctly referring to the passage before us. Therefore I would suggest what she says here is this:—

Malae mulieres, ne pave, peiores usu fiunt.

I will merely record one or two more conjectures, and lay down this most interesting book. In 1247 I think a passive infinitive is wanted, and would suggest *tam vi fervente amari*. In 1333, *quietem* before *malo*, instead of *abscedas* after it. In 1341, *etiam mi* for *et me*. In 1395, *vestem* before *discindite*, instead of *actutum* before *sit*. The slaves are only bid to get ready for the punishment of the *Miles*, and *actutum* is generally wrongly supplied in the passage quoted from the *Captivi*, 653. It should run, I think—

Inicite manicas *manibus* huic mastigiae.

CATULLUS.

lxxi.

Si qua uiro bono sacratorum obstitit hircus,
 Aut si quam merito tarda podagra secat,
 Aemulus iste tuus, qui vestrum exercet amorem,
 Mirifice est a te nactus utrumque malum.
 Nam quotiens futuit, totiens ulciscitur ambos;
 Illam affligit odore, ipse perit podagra.

O alone gives *sacratorum*. I think the old corrections *quoi* in the first verse, and *quem* in the second, are certain. But I cannot accept Froelich's reading, though I should like to do so:

Si quoi iure Bonae sacratorum obstitit hircus,

although this seems at first sight defended by 102. 3:

Meque esse invenies illorum iure sacratum.

What did Catullus know of the rites of Bona? What does he mean by 'initiated in the rites of Bona'? Does he mean a fornicator? He would not have ventured on

such open blasphemy, even if he had an idea that the nature of the rites of the Bona dea were in fact impure. I propose :

Si quoi iure bonae SCORTATORVM obstitit hircus,
Aut si quem merito tarda podagra secat.

Bona is used of a woman who is not chary of her favours, as in Propertius :

Discite desertae non temere esse bonae.

Iure, 'justly,' has its counterpart in *merito* in the next line. The similarity between *scortatorum* and *sacratorum* is obvious.

Catullus, cxv.

Mentula habet instar triginta iugera prati,
Quadráginta arvi : cetera sunt maria.

Instar is probably, though not certainly, corrupt. First, because of *habēt* ; secondly, because it has an unusual construction ; thirdly, because it has a weak sense. I hold that a word was originally wanting, and that the lines originally ran :

Mentula habet RIGVI triginta iugera prati,
Quadráginta arvi : cetera sunt varia.

Rigui, 'well-watered,' may have dropped out before *trigi-* ; *t* preceding. *Paria* perhaps may be right for *maria* : 'he has other possessions to match' ; but I prefer Baehrens' *varia*.

HORACE.

Satires, i. 3. 117, *seqq.*

Adsit

Regula, peccatis quae poenas inroget aequas
 Ne scutica dignum horribili sectere flagello.
 Nam ut ferula caedās dignum maiora subire
 Verbera, non vereor, cum dicas esse pares res
 Furta latrociniis, et magnis parva mineris
 Falce recisurum simili te, si tibi regnum
 Permittant homines.

One of the first lessons instilled into us at school is that *vereor ne* means 'I fear he will'; and *vereor ut*, 'I fear he won't.' But when we come to this passage, we are told to throw our syntax to the winds, and to believe that Horace here uses *vereor ut* as in fact equivalent to *vereor ne*. And why? Because *ut* comes first. 'The position of *ut* makes it independent of *vereor*,' says Maclean. 'Cum autem praecedant vv. *ut caedas* longe minus in iis lector offendit,' says Orelli. But we turn to *Satires* 2. 1. 61, and we find 'O puer ut sis vitalis metuo,' with *ut* coming first and the ordinary rule maintained. In fact, Horace is remarkably precise in his observance of the rule. The very best instance of it occurs in his writings, *Sat.* i. 4. 32: 'nequid Summa deperdat metuens aut ampliet ut rem.'

Did Horace here write in such a muddled style that he could not remember in one line what particle he had used the line before? I think not.

Either *ut* or *non* must be ejected. Critics have failed in their assault on *ut*; but *non*, I think, may be carried by storm. I therefore propose to read as follows:

Nam ut ferula caedas dignum maiora subire
 Verbera NVNC vereor, cum dicas esse pares res
 Furta latrociniis, *et*.

The meaning will be: 'Let there be a rule which shall inflict fair punishments on offences, so that you may not slash with the cruel scourge the culprit who merely deserves the whip. For, *as matters now stand*, while you say offences are equal, *I am afraid you won't* beat with a cane one who deserves a severer lashing.' Horace implies he would have no particular objection to the Stoic paradox if it was likely to lead to equality on the side of mercy; but he fears it would not be so—the tendency would be to equalise on the side of severity.

Non and *nunc* are sometimes confounded in MSS. For instance, in Ars. Poet. 43, 'ut iam nunc dicat iam nunc debentia dici,' the copies are divided between *non* and *nunc* before *debentia*.

Finally, *nunc* in the sense it bears here, 'as matters now are,' is often defined by a following *cum*, as here. Plaut. *Amph. Prol.* 129: Nunc, quom esse credent servum et conservum suum. Cic. *Agr.* ii. 31. 85: Nunc vero cum ad nos nihil pertineat.

Epist. 1. 2. 28–31.

Sponsi Penelopae nebulones Alcinoique

In cute curanda plus aequo operata iuventus:

Cui pulchrum fuit in medios dormire dies et

† Ad strepitum citharae cessatum ducere curam.

There is little need of argument to show that the construction 'ducere curam cessatum' was never formed by Horace. That illustrious critic, Mr. Munro, in the last number of the *Journal of Philology*, prefers the reading of the Blandinian *somnum*, suggesting *recreatum*, in its primary sense of 'restored,' for *cessatum*. I cannot, however, agree with him that there is no tautology in the two verses as thus arranged; and, what is more important, was any-

one in Ithaca or elsewhere ever known to prolong sleep to the sound of the harp? I think the sense of dancing is required; and we may extract *crura* easily from *curam*, and read:

Ad strepitum citharae cessatim ducere CRURA.

The phrase ἔλκειν σκέλη would, I think, be used in Greek to denote the slow measures of a dancer. Compare the phrases κόρδαχ' ἔλκυσεν, *Ar. Nub.* 540. *Ducere brachia* is used of dancers, *e.g.*, by Ovid, *Am.* 2. 4. 29. Why should not *ducere crura* be used? The lazy sons of Priam are rebuked by him as being

ψεύσταί τ' ὀρχησταί τε, χοροῖτυπήσιν ἄριστοι.

This is just the character of the Phaeacian courtiers. I have suggested *cessatim* for *cessatum*, 'in lazy fashion.' The word is not found, but might be formed, on the analogy of *certatim* and *exultim* (also ἀπαξ εἰρημένον); otherwise we might read *cessantia* or *cessare et*.

A. PALMER.

January 20, 1881.

UNEDITED CONJECTURES OF MARKLAND.

EMENDATIONES et coniecturas Marklandi ineditas in Catullum et Tibullum descripsi ex exemplari edit. 1723 Paris. in lucem emisso continente Catull., Tibull. et Propert. (sed Propertius in hoc exemplari desideratur), in cuius marginibus Markl. eas adposuit. Exemplar istud nunc in Museo Britannico adservatur sign. 834. K. 1 (olim Gal. 10 Sd.).

- XXV. 5 (XXVIII. 5), *Vappa*] f. Verpa: ut v. 12 et XLIV. 4
(XLVII. 4).
- XLV. 5 (XLVIII. 5), *aridis*] l. Africis (cf. Ep. Crit. 157).
- LX. 21 (LXIV. 21), *sensit*] f. sanxit.
- 94 *misere exagitans*] f. miseros agitans—et
forte hic versus cum sequentibus coniun-
gendus est.
- 109 *lateque*] f. longe.
- 111 *vanis*] f. vacuis.
- 287 *Nereidum*] Spanhem. ad Callim. p. 412
citat hunc locum ita, *Nessonidum* lin-
quens, etc.
- 362 *debita*] f. debita.
- LXII. 44 (LXVI. 44), *Phthiae*] *Thiae*. Bent. Schol. Hom. II. 6.
v. 480.
- 73 *dictis*] dextris, Bent.
- LXIV. 65 (LXVIII. 65), *prece*] q. face, scriptum fuit phace, unde
istud *prece*. Sen. Herc. Fur. v. 38.
- LXXXI. 2 (LXXXVI. 2), *hoc ego: sic singula confiteor*] l. haec ego,
si singula, confiteor; Totum istud FOR-
MOSA, nego: etc.

LXXXVIII. 3 (XCIV. 1), *Mentula moechatur*. Moechatur mentula? certe Hoc est, etc. ita disting.

XCV. 2 (CI. 2), *miseras*] f. seras.

Praef. p. X. l. 19, *nulla temere* etc.] Hoc adeo non verum est, ut vix ulla pagina sit in edit. Scalig., in qua non peccatum sit in hac parte.

1. Carm. XXVII., cf. epist. crit. pag. 73 seqq.—2. Ad Euripid. Iphig. in Aul. 1073, Markl. observat, 'Catullus multa ex hoc Musarum cantico (1036 seqq.) videtur sumpsisse vel respexisse.'

Ad Tibullum.

I. 1. 3, *labor*] q. pavor.

55, *retinent—vincla*] f. retinet—cura.

2. 19, *decedere*] q. descendere.

61, *nocte serena*] Lucret. 'noctes vigilare serenas.'

62, *Deos*] q. focos. Propert. I. 1.

3. 32, *debeat*] debetrix sit, ὀφειλέτης εἶη.

36, *Tellus* etc.] sine sensu. lege *Tethys* (i. e. mare) in longas, etc. Val.

Flaccus: *pelagus* quantos *aperimus* in usus! Pindar. Pyth. V.:

Τοὺς Ἀριστοτέλης ἔγαγε ναυσὶ θαλαῖς
Ἄλδ' ἐ βαθείαν κέλευθον ἀνοίγων.

M. Sen. Suasor. 3: 'Vos ergo ad haec, Dii immortales, invoco: sic *reclusuri* estis *maria*?' Stat. Achill. Antholog. lib. I. p. 123: de mense Maio: Ὄψεται ἔρτι θάλασσα. Philo Judaeus de Monarch. lib. II. p. 564, ed. Turneb.: τίς δὲ τὰς ἐν θαλάττῃ καὶ τοσαύτοις πελάγεσιν ὁδοὺς ἀνέτεμε καὶ ἀνέδειξε πλωτῆρσι, εἰ μὴ αἱ τῶν ἀστέρων στροφαὶ καὶ περίοδοι. Aristid. Isthm. in Nept. p. 19, ed. Jebb: τί δὲ ἦν αὐτῷ καλὸν πρὶν παρανοῖξαι τὸν θεὸν τοῦτον τὴν θαλάτταν, etc.

47, *acies*] f. rabies.

49, *semper*] f. saevum Nunc mare.

51, *pater*] f. precor.

75, *terrae*] f. *matris*: cuius glossa fuerit τὸ *terrae*.

4. 66, *Sapplicibus, miseris*] f. *supplicis, et miseri*.

72, *placidam*] f. *facilem*.

74, *ante genos*] i. e. *in genis*.

5. 6, *horrida*] f. fortia.
 6. 2, *in lacrimas, verterat omne merum*] Heliodorus Aethiop. V. 33,
ἐπιφορον γὰρ τὶ πρὸς δάκρυον εἶναι.
 33, *furta*] l. fata.
 34, *fors*] Fors.
 8. 16, *arat*] omnino *alat*.
 47, *dulcis*] l. dulci.
 49, *centum ludos*] l. Genium : ludis, cf. M. remarks on the epistles of
 Cicero to Brutus : London, 1745, pag. 68.
 11. 43, *Sic*] f. Hic. Horat. Nimirum *hic* ego dum. Propert.: *Hic* ego
 Pelides, etc.
 II. 5. 21, *credebat*] f. cernebat.
 48, *venit*] f. veni! Above 6. 25 : cf. M. ad Stat. Silv. I. 4. 55.
 III. 4. 20, *ante*] id est *in* : ut, stat pudor *ante* *genas*.
 21, *ortu*] Alibi conieceram *Oeta* et ita legendum puto ap. Senecam
 Troad. 170. Summa iam Titan iuga stringebat Oetae : vicerat
 noctem dies, cf. M. Stat. Silv. II. 2. 45.
 83, *votis*] f. nostris.
 5. 10, *dedi*] malle *dedi*.
 IV. 1. 32, *futurus*] q. futuris.
 37, *victor*] f. victus.
 2, 10. *est*] f. stat ita ap. Auson. Mosell. v. 321. ed. Stoer. Haec est
 nati sublimis in aggere Saxi : lege, Haec *stat*.
 13. 9, *Sic*] l. Tecum, cf. M. ad Stat. Silv. V. 3. 213.

Fortasse ea pars ed. Paris. quae Propertii carmina continet, in aliqua bibliotheca Angliae latet, sicut et Quaestiones Venusinae ad Horatii carmina : cf. Biographical Dict., p. 22 et 508, ubi haec verba, 'and Mr. Markland at that time was preparing an edition of Propertius with short notes,' etc. Denique nemo harum litterarum peritus ignorat Markl. in commentar. in Stat. Silv. perplures locos et unum p. 257. Euripid. Supplic. Lond. 1763, emendasse aut coniectura temptasse.

156 UNEDITED CONJECTURES OF MARKLAND.

Ierem. Marklandi coniecturae in Lucretium desumptae ex marginibus ed. Lugdun. Batav. 1595, quae in Museo Britannico adservatur et 1068 h. 10 insignita est.

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|--------------|---------|-----|-------|--|
| Lib. I. pag. | 3, lin. | 6. | 63, | <i>ante oculos]</i> q. c = quaere. |
| | | | 28. | 85, <i>virginis arma]</i> virg. aram. |
| | 5, | 22. | 143, | <i>serenas]</i> f. <i>severas</i> . ita Propert. II. 3. 7 studiis
vigilare <i>severis</i> (ita et Creech.). |
| | 6, | 19. | 172, | <i>ubi]</i> f. <i>uti</i> . |
| | 6, | 21. | 174, | <i>secreta]</i> q. |
| Lib. I. pag. | 7, | 16. | 201, | <i>pontum]</i> f. <i>ponti</i> . |
| | 7, | 31. | 216, | <i>uti quaeque]</i> f. <i>u. quasque</i> sc. <i>res</i> , ita mox
<i>quaeque</i> . |
| | 8, | 24. | 241, | <i>endopedita]</i> f. <i>endopeditos</i> . |
| | 9, | 28. | 277, | <i>pontus]</i> q. <i>ventus</i> . |
| | 12, | 19. | 364, | <i>inanis]</i> q. |
| | 13, | 1. | 378, | <i>receptum]</i> f. <i>reperitum</i> . |
| | 33, | 16. | 1033, | <i>vivant]</i> f. <i>vigeant</i> . |
| Lib. II. | 38, | 18. | 75, | <i>et]</i> f. <i>ut</i> . |
| | 56, | 20. | 653, | <i>lumina solis]</i> <i>luminis oras</i> , cf. pag. 55. 16
(vs. 617). |
| Lib. VI. | 205, | 17. | 356, | <i>alta]</i> l. <i>apta</i> (ita et Wakefield). |
| | 224 | 7. | 954, | <i>colis]</i> l. <i>coeli</i> . |

[The above Paper is communicated by Mr. Albert Stachelscheid.]

WHAT WAS LOCKE'S DOCTRINE OF PERCEPTION?

VARIOUS opinions have been held as to what was really Locke's doctrine of Perception; nevertheless, I venture to think that the true point of view has hitherto been missed.

The key to his opinions on this subject is to be found in the treatise referred to by Sir W. Hamilton, and entitled 'An Examination of P. Malebranche's Opinion.' The importance of this essay for this purpose arises from the fact that in it Locke expressly discusses a particular theory of Perception, a thing which he studiously avoided doing in the essay on the Human Understanding. Yet it has been generally overlooked by his critics; and Hamilton, who refers to it, appears only to have dipped into, not to have read it. The same may be said of some who have commented on Hamilton's criticism.

Every reader of Hamilton will remember the passage in which, by the help of a quotation from the "Examination," he triumphantly overwhelms Dr. Thomas Brown. The latter had found fault with Reid for attributing to Locke the coarser form of representative Perception, and had himself argued that Locke held the more refined form of the doctrine—that in which the Idea is a modification of mind. Hamilton is, I believe, partly right and partly wrong—right as against Brown, wrong in his vindication of Reid's interpretation. The passage, as quoted by Hamilton, is as follows (§ 39).:—"But to examine this doctrine of modification a little further. Different sentiments are

different modifications of mind. The mind or soul that perceives is our immaterial indivisible substance. Now, I see the white and black on this paper, I hear one singing in the next room, I feel the warmth of the fire I sit by, and I taste an apple I am eating, and all this at the same time. Now, I ask, take *modification* for what you please, can this same unextended, indivisible substance have different, nay, inconsistent and opposite (as these of white and black must be) modifications at the same time? Or must we suppose distinct parts in an indivisible substance, one for black, another for white, and another for red ideas, and so of the rest of those infinite sensations which we have in sorts and degrees; all that we can distinctly perceive, and so are distinct ideas, some whereof are opposite, as heat and cold, which yet a man may feel at the same time? I was ignorant before how sensation was performed on us; this they call an explanation of it. Must I say now I understand it better? If this be to cure one's ignorance, it is a very slight disease, and the charm of two or three insignificant words will at any time remove it, *probatum est.*' Hamilton's comment on this is to the following effect:— 'An acquiescence in the doctrine that the *secondary* qualities of which we are conscious in *sensation* are merely mental states by no means involves an admission that the *primary* qualities of which we are conscious in *perception* are nothing more. Malebranche, for example, affirms the one and denies the other. Now, if Locke be found to ridicule, as he does, *even* the opinion which *merely* reduces the secondary qualities to mental states, *a fortiori*, and this *on the principles of his own philosophy*, he must be held to reject the doctrine which would reduce not only the non-resembling sensations of the secondary, but even the resembling and consequently extended ideas of the primary qualities of matter to modifications of the immaterial, unextended mind.' This is the only passage which prevents Hamil-

ton from considering *suspense* more rational than any dogmatic conclusions respecting Locke's own doctrine of Perception. Now that Hamilton is wrong in his inference is clear from the context immediately following. For Hamilton regards it as a necessary consequence of Locke's philosophy that it is easier to admit that secondary qualities are modifications than that the primary are so. Now, in the very next sentence following Hamilton's quotation, Locke expressly asserts the contrary. 'Let it (modification) signify what it will, when I recollect the figure of one of the leaves of a violet, is not that a new modification of my soul as well as when I think of its purple colour?' Elsewhere also (§ 48 *e.g.*) he argues similarly:—'I desire,' he says, 'to be informed how my mind knows that the thinking on or the idea of the figure is not a modification of the mind; but the thinking on or having an idea of the colour or hardness is a modification of the mind.' Hamilton, in fact, begs the question when he says Locke rejects the opinion which '*reduces* the secondary qualities to mere modifications of mind.' In short, he came to the passage with a preconceived idea as to Locke's views.

The false interpretation being rejected, nothing remains to oppose to Locke's frequent declarations that the having an idea and Perception are the same thing. Indeed, in this very work, as we have just seen, he uses 'thinking on' as equivalent to 'the idea of,' and he argues against the supposition that ideas are 'real spiritual things,' as Malebranche asserted.

Locke's objection to the term modification was not, as Hamilton thought, that it allowed too little objectivity to the secondary qualities; it was one of a wholly different nature. 'In calling perception or ideas mental modifications, you pretend to give some explanation, or, at least, to substitute a more philosophical term for a vulgar one; whereas either modification means nothing, is, in fact,

only 'a new sound without any new conception at all' (Examin. § 48), or it suggests a meaning which is really absurd.' That this is the true gist of his objection will appear from the quotations to be given presently. But first I may notice Professor Webb's interpretation. Professor Webb ingeniously suggests that while Locke objected to calling ideas modifications of mind in the sense of modifications of the mental substance, he would have had no objection to regarding them as modifications of mental energy. This, however, by no means meets Locke's objections. He might still reasonably ask, Is it possible for the same individual mind to have different, nay, opposite energies at the same time? But we are not left to inference, for Locke has actually stated this view himself, and has rejected it; for in sect. 40 he speaks of 'new modifications in the mind' as meaning nothing but 'different action or passion.'

The following extracts will show the correctness of the preceding representation:—'This word *modification* here that comes in for explication seems to me to signify nothing more than the word to be explained by it; *v.g.* I see the purple colour of a violet. This, says he, is a *sentiment*. I desire to know what *sentiment* is; that, says he, is a *modification of the soul*. I take the word and desire to see what I can conceive by it concerning my soul; and here, I confess, I can conceive nothing more but that I have the idea of purple in my mind which I had not before, without being able to apprehend anything the mind does or suffers in this besides barely having the idea of purple, and so the good word *modification* signifies nothing to me more than I knew before; *v.g.*, that I have now the idea of purple in it which I had not some minutes since. So that, though they say sensations are modifications of the mind, yet having no manner of idea what that modification of the mind is, distinct from that very sensation, *v.g.*

the sensation of a red colour or a bitter taste, it is plain this explication amounts to no more than that a sensation is a sensation, and the sensation of red or bitter is the sensation of *red* or *bitter*; for if I have no other idea when I say it is a modification of the mind than when I say it is the sensation of *red* or *bitter*, it is plain, sensation and modification stand both for the same idea, and so are but two names of one and the same thing' (§ 39). Then follow the words quoted by Hamilton, in which Locke shows that it is impossible to attach any clear idea to the words 'modification of mind'; and lastly, he argues that, whatever it means, it is as applicable to the ideas of the primary qualities as to those of the secondary. 'When I recollect the figure of one of the leaves of the violet, is not that a new modification of my soul as well as when I think of its purple colour? Does my mind do or suffer nothing anew when I see that figure in God?' Note here how he actually had in view the conception of 'modification of the mental energy.' He goes on:—'The idea of that figure you say is in God. Let it be so; but it may be there and I not see it; that is allowed; when I come to see it, which I did not before, is there no new modification, as you call it, of my mind? If there be, then seeing of figure in God as well as having the idea of purple, is a *modification of the mind*, and this distinction signifies nothing. If seeing that figure in God now, which a minute or two since I did not see at all, be no new modification or alteration in my mind, no different action or passion from what was before [note this], there is no difference made in my apprehension between seeing and not seeing.' And in sect. 48, 'when he says seeing a colour and hearing a sound is a modification of the mind, what does it signify but an alteration of the mind from not perceiving to perceiving that sound or colour? And so when the mind sees a triangle, which it did not see before, what is this but an

alteration of the mind from not seeing to seeing, whether that figure be seen in God or not? And why is not this alteration of the mind to be called a modification as well as the other? Or, indeed, what service does that word do us in the one case or the other, when it is only a new sound brought in without any new conception at all? For my mind, when it sees a colour or figure, is altered, I know, from the not having such or such a perception to the having it; but when to explain this I am told that either of these perceptions is a modification of the mind, what do I conceive more than that from not having such a perception my mind is come to have such a perception? which is what I as well knew before the word *modification* was made use of, which by its use has made me conceive nothing more than what I conceived before.' Again, in the 'Remarks on Mr. Norris's Books,' Locke observes that he himself is complained of for not having 'defined the nature of ideas.' This, he says, cannot mean making known to men their ideas, for no 'articulate sounds of mine or anybody else can make known to another what his ideas—that is, what his perceptions—are, better than what he himself knows and perceives them to be.' It must therefore mean that he has not explained the causes and manner of production of ideas, that is, perceptions in the mind, '*i.e.*, in what alteration of the mind this perception consists; and as to that I answer, no man can tell, for which I not only appeal to experience, which were enough, but shall add this reason, *viz.*, because no man can give any account of any alteration made in any single substance whatever; all the alteration we can conceive being only of the alteration of compounded substances, and that only by a transposition of parts.' 'I desire him to explain to me what the alteration in the mind is, besides saying, as we vulgar do, it is having a perception which it had not the moment before; which is only the difference between perceiving and not

perceiving; a difference in matter of fact agreed on all hands; which, wherein it consists, is, for aught I see, unknown to one side as well as the other; only the one has the ingenuity to confess their ignorance, and the other pretends to be knowing.' It will be observed that he allows that perception is a modification of the mental energy (if energy includes passion as well as action), but he denies that this conveys any sort of explanation of the nature of the ideas, or in fact means anything except that perceiving is not identical with not perceiving. The last quotation appears to show that he did not even contemplate the cruder form of representation which Reid attributes to him.

How little Hamilton understood the true meaning of Locke's objection is further manifest from a note in the *Discussions*, in which he remarks as a curious fact that the very thing which Locke here regards as inconsistent with the nature of an unextended substance has been regarded by certain other philosophers as a proof that the mind is itself unextended. There is nothing in the least inconsistent with Locke's words in such an argument. He does not argue that the ideas are extended, or must be modifications of an extended substance, but that to pretend to account for them by saying that they consist in modifications of an unextended substance is to involve ourselves in contradiction.

I have quoted these passages at some length, because they not only indicate Locke's own view, but have a value of their own, as exposing the futility of such theories as Brown's, which pretend to dispose of the problem of perception by the assertion that perception is simply a state of mind, or a mental modification (the very word is used), from which, by a known principle, we infer, &c. Locke's habit of requiring a clear and determinate meaning to be attached to words enabled him at once to discern that this

was mere playing with words. To explain is to show that a less general fact is a case of a more general. Now, perception is a fact *sui generis*; the only element in it which creates any difficulty is the element which distinguishes it from other mental phenomena. Hence it cannot be referred to any more general class, except at the cost of eliminating its very essence. When this is done it is, of course, easy to draw the conclusion that this essence is nothing. Thus: 'what appears to be cognition of the non-ego is, like all cognition, a state of mind; but that which is merely a state of mind cannot involve a knowledge of anything out of mind; therefore all such appearance is or may be a delusion.' This argument has the advantage of proving strictly *a priori* the absolute impossibility of a cognition of one thing by another, a circumstance which might make some philosophers hesitate about accepting it. In fact, it contains a *petitio principii* so obvious that it is singular how it has imposed on so many persons of acute intellect. Locke's remarks indicate the fallacy. If by 'state of mind' you mean that perception is a phenomenon of essentially the same kind as the purely intra-mental phenomena, then there is a *petitio principii*. If you mean only that it is a phenomenon in which mind is concerned, then nothing follows.

To modify Plato's celebrated simile, suppose a number of persons only able to see the reflection of passing objects in a mirror, and suppose one of them to say, 'Oh! these are modifications of the surface of the mirror,' would he have advanced much thereby towards the true explanation of the phenomenon?

If perception is simply a mental phenomenon, it is impossible to resist the conclusion that volition is equally a mere mental phenomenon, and cannot pass outside the mind. It must be as absurd to suppose that my volition can affect anything outside the mind, so as, *e.g.*, to produce

sensations in other minds, as to suppose that a state of my own mind can give me any knowledge of what passes in those other minds. When I swing my arm I am conscious of a purely mental phenomenon, which no other mind can perceive, still less complain of. It may be plausibly argued, that if minds know anything of what passes in other minds—in other words, if there is such a thing as intercourse of thought—then either one mind must directly perceive the other, or the second must be able directly to influence the first, or else there is a medium, and the one mind produces an effect of which the other mind is able to have knowledge. The only alternative is a system of occasional causes, or the like. It is remarkable that when Mr. Mill was at a loss to find reasons for believing the existence of other minds (a fatally weak point in his system), he did not refer to the fact of the interchange of thought. I do not stay to develop this; it is sufficient to have made the suggestion.

It is very remarkable to find Locke, in the essay on Malebranche, making the very same objections against the 'Representative Idea' which were subsequently alleged by Reid and others; and in particular by Cousin, who was little aware that in combating 'Locke's idea-image,' he was slaying what Locke had already slain.

Malebranche had said that ideas were 'real spiritual beings.' 'Real beings,' says Locke, 'may be either modes, substances, or relations'; but he thinks that Malebranche must mean here 'substances,' because he says it is absurd to think they are annihilated when not present to the mind. Now, argues Locke, first, it is inconceivable how a spiritual, *i.e.* unextended substance should represent to the mind an extended figure; secondly, supposing the representation possible, it is inconceivable how we should see it (sect. 18); and thirdly, if we did see it, we never could tell that the thing represented was

there, since we cannot possibly see it (sect. 53). He refers to the hypothesis that the soul can trace images on the brain, and perceive them, and says this is matter of new perplexity; for if the soul cannot perceive material things (which Malebranche asserts), it is inconsistent to say it can perceive images on the brain (sect. 15).

It is time to ask the question, What was Locke's own view of the question of perception?

Theory he had none, and this he expressly declares. He contents himself with stating the fact in its entirety, and this he does almost in the language which Stewart quotes from Reid as the true statement apart from theory: 'If I should say, that it is possible God has made our souls so, and so united them to our bodies, that upon certain motions made in our bodies by external objects the soul should have such or such perceptions or ideas, though in a way inconceivable to us; this, perhaps, would appear as true and as instructive a proposition as what is so positively laid down' (sect. 8). And again, 'One who thinks that ideas are nothing but perceptions of the mind annexed to certain motions of the body by the will of God, who hath ordered such perceptions always to accompany such motions, though we know not how they are produced, does in effect conceive those ideas or perceptions to be only passions of the mind, when produced in it, whether we will or no, by external objects' (sect. 15). The context shows that he gives this as a statement which he himself accepts. In sect. 11 he says we may be said to see the picture in the retina, as when it is pricked we are said to feel pain in our finger. The reason why we are apt to think that the ideas belonging to extension are got another way than other ideas is because, our bodies being extended, we cannot avoid the distinction of parts in ourselves (sect. 50).

A remark or two in conclusion. It would be out of

place to open up the endless problem of Perception here, but it may not be out of place to point out how the knot of the problem is evaded by certain theories. For instance, any theory which makes no distinction between the definite perception of an object and the indefinite belief in a cause leaves out the essence of the phenomena. According to such theories, I perceive an object which I see and feel only in the same sense in which I perceive the author of the book I am reading, or in the same sense in which, when I have a tooth-ache, I perceive the draught that caused it. If this is proved, well and good; what I object to is the assumption of it as a starting-point.

Again, the knot of the problem is missed by a theory which confounds the perception of a present object with the belief in the existence of an object formerly perceived. These two things are carefully distinguished, *e.g.*, by Locke, Hume, and Stewart. Locke admits that we have a sensitive knowledge of things actually present to the senses; whereas he allows no knowledge of the existence of things not so present, 'it being no more necessary that water should exist to-day because it existed yesterday, than that the colours or bubbles [which I once saw on the water] exist to-day because they existed yesterday; though it be exceedingly much more probable, because water hath been observed to continue long in existence, but bubbles and the colours on them quickly cease to be,' although, as he says, it is equally true that I saw the bubbles and that I saw the water. Hume again expressly lays down the distinction—'We ought to examine apart those two questions, which are commonly confounded together, *viz.*, why we attribute a *continued* existence to objects even when they are not present to the senses, and why we suppose them to have an existence distinct from the mind and perception?'—(*Treatise on Human Nature*, Bk. I. pt. 4, sect. 2).

Stewart also, after commending Reid's treatment of the problem of perception, adds that there is still one omission in it, viz., that he has not accounted for our belief in the independent and continued existence of objects, even when we are not perceiving them (*Philosophy*, pt. i. ch. 3). Notwithstanding this, Mr. Mill commences his discussion of the problem by asserting that this latter belief is the whole of the phenomenon to be accounted for; and not only this, but he actually affirms that Stewart agrees with him.¹

It is scarcely necessary to mention that Kant has steered perfectly clear of such misconceptions as these.

¹ Locke's example of the bubbles would not be easily brought under his theory.

T. K. ABBOTT.

LOGICAL NOTES.

I.—ON A FLAW IN A RECEIVED LOGICAL PROCESS.

IT may seem a bold thing to affirm that a process which has been unquestionably admitted by all logicians, ancient and modern, is invalid. Yet I cannot see how the process known as *Reductio ad impossibile* can be defended. Of course I do not mean that the reasoning involved in it is fallacious, but that as an attempt at Reduction it is a complete failure. The function of reduction is to show that the Dictum is the universal *formal* principle of mediate reasoning. The problem, therefore, in any particular case is this: From the given premisses to deduce the conclusion by means of a syllogism or syllogisms in the first figure, combined with immediate inferences. Now, take a syllogism in Baroko. Every P is M; some S is not M; therefore some S is not P. We are told to substitute for this the syllogism, Every P is M; every S is P; therefore every S is M. But how is the conclusion—Some S is not P—deduced from this? True premisses, it is said, can only lead to a true conclusion. Therefore, when the conclusion is false, one of the premisses is false; but here the major is assumed true. Therefore the minor is false. Now, here is an additional chain of reasoning which we are bound to state syllogistically. Put in the briefest form it stands thus (the truth of the major being assumed): If every S is P, every S is M. But some S is not M, therefore some S is not P. This hypothetical syllogism must be reduced to a categorical. But this process will give us back the ori-

ginal syllogism. All that we have gained then is, that for the original simple syllogism we have substituted a syllogism in the first figure *plus* another piece of reasoning not in the first figure.

It is obvious that it would not be admissible to take as a major premiss the formal maxim, 'If the premisses are true the conclusion is true.' To do so would be to make the dictum itself a premiss. But even if we did so, we should be driven back precisely as above upon the original reasoning. The only means of escape would be to take for one premiss the converse of this, viz.: If the conclusion is false (the major being given true), the minor is false, &c. This syllogism might be brought into a categorical form in the first figure. 'A syllogism with a false conclusion is a syllogism with a false premiss,' &c.; but the hypothetical major is only a converse by negation of the maxim, 'If the premisses are true the conclusion is true.' Applied to the particular case in question it would be: If some S is not M, some S is not P, or 'the case of some S not being M is the case of some S not being P,' &c. This is no reduction. It is clear, however, that logical writers did not contemplate such an evasion of the difficulty; they simply overlooked the difficulty altogether. Satisfied with the production of a syllogism in the first figure, they forgot that it did not complete the reasoning.

Professor Monck, to whom I had mentioned this difficulty, suggests a method of evading the objection, and having stated one syllogism of his process, he says he 'believes' the proof could be completed 'without requiring any other figure than the first' (*Introd. to Logic*, p. 180, *note*). This is an admission that the reduction as hitherto exhibited is imperfect (and therefore illusory), and that the possibility of reduction by this method has yet to be proved. His omission to supply the defect is the

more remarkable as he devotes several pages to the received process. I may add that the proof he proposes, even if completed, would not solve the problem. For what he proposes to attempt is a proof of the abstract proposition that 'Baroko is a legitimate mode'; but this, if proved, would still leave the problem of its reduction to the form assumed in the Dictum unsolved. •

Logic is nothing if not exact: this is sufficient reason for asking attention to the two following notes:—

II.—ON THE GEOMETRICAL SYLLOGISM.

WRITERS who undertake to bring Euclid's reasoning into syllogistic form present us with syllogisms of this kind:

Things equal to the same are equal to one another; A and B are equal to the same. Therefore A and B are equal to one another.

Now, this syllogism is not formally correct, as will be obvious at once if we attempt to prefix the sign of distribution to the subject of the major: Everything equal to the same is equal to one another, which is nonsense. In the first place, as to the subject; 'things' is not taken distributively, but in groups determined by 'the same.' It is this term 'the same' which really indicates the distribution of the subject. Secondly, as to the predicate, 'equal to one another' does not express any property common to the parts in extension of the subject, nor is it the name of a class in which they are included. Hence it could not be replaced by a symbol. We can say, 'If A and B are x and C and D are x , then A and B and C and D are x ;' but we cannot substitute 'equal to one another' for this x . The fact is, that the expression 'equal to the same,' 'equal to one another,' are abbreviations. 'A and B and

C are equal to the same' is equivalent to three propositions. 'A is equal to x , B is equal to x , and C is equal to x .' 'A, B, and C are equal to one another' is equivalent to six propositions, and so on. Hence, if the axiom is to be used as a major premiss at all, it can only be in the form 'every pair (or group) of things equal to the same is a pair (or group) of things equal to one another.' But this is, in fact, only the formal principle of the reasoning. The proposition, A is equal to B means, the magnitude of A is identical with the magnitude of B. The syllogism 'A is equal to B; B is equal to C,' &c., is therefore a syllogism in identity, and is not made more correct in form by being assimilated to inferences respecting the relations of concepts. The form of the Dictum best adapted to include such cases is that given by Aristotle himself; *ὅσα κατὰ τοῦ κατηγορουμένου λέγεται πάντα καὶ κατὰ τοῦ ὑποκειμένου ῥηθήσεται*. This also obviates Mill's objection founded on the use of the word 'class' in the form which he quotes from Whately.

III.—ON AN UNOBSERVED AMBIGUITY.

IT is a singular thing that the syllogism selected in Whately's Logic (in all the editions) as the most elementary type of the fallacy of undistributed middle is not a case of that fallacy at all. It is this: 'Food is necessary to life; corn is food; therefore corn is necessary to life. To make this a case of undistributed middle, the major ought to mean 'Certain kinds of food are necessary to life,' but this is obviously not the meaning. Nor is it meant that 'food' collectively is necessary to life. The proposition then seems less easy to treat logically than at first sight appeared. The solution of the difficulty seems to me to be that the logical subject is not 'food,' but 'life,' and the word 'necessary' indicates that this is taken universally. What is meant is, that there is no life without food,

or, as the idea of cause is involved, 'All life is dependent on food.' There are, therefore, four terms.

It is a noteworthy circumstance that the Latin language would not allow 'Food' to be treated even as the grammatical subject of the proposition in question.

There are some other forms of expression which require similar treatment. I shall notice one which involves an ambiguity of the word 'some,' which is often overlooked, *ex. gr.* 'Some malcontents were present at every meeting.' Here I do not mean to assert of certain individuals that they were present at every meeting; but that every meeting had in it malcontents. 'Meeting' is the logical subject, and 'some' means, not some certain, but 'some or other,' not *quidam* or *sunt qui*, but *aliqui*. If in the proposition first quoted we had said, 'Some food is necessary to life,' 'some' would have been used in this sense.

T. K. ABBOTT.

AN EXAMINATION OF MANSEL'S THEORIES OF CAUSALITY, SUBSTANCE, AND THE *EGO*.

I SHALL commence with Cause and the Principle of Causality, as Mansel's account of the origin of these ideas has considerable bearing on the solutions he adopts of other Metaphysical problems, especially that of Substance.

In connexion with Cause, Mansel apparently distinguishes three distinct beliefs for which the Metaphysician has to account:—

1. The belief in the general Principle of Causality.
2. Belief in Causal Efficiency, or power of antecedent to produce consequent, in any particular presented sequence which we regard as a case of causation.
3. The belief in the necessity of this last relation, *i.e.* the belief that in this particular case the antecedent necessarily produced the consequent: see Mansel's *Metaphysics*, pp. 266–271.

To examine 1: Mansel maintains that the only necessity involved in the belief in the general Principle of Causality is, a necessity of believing that every event must have had some temporal antecedent, which is afterwards united by association to the empirical notion of the uniformity of the course of Nature (see *Metaphysics*, p. 268). Looking back to see whence Mansel derives the necessity

he admits, we find he derives it from the *intuition* of time, without any reference to the understanding (same page). This amounts to an admission that time is presented to us in its character of Unity and Continuity, quite independently of the Categories and the action of the understanding; and, as Mansel himself states, 'I can be conscious of time only in conjunction with a succession of events taking place in time' (p. 268). We may fairly assume that our experience in time has (according to Mansel) its connexion and continuity given either in its own presentation or by the intuition of time—in any case in complete independence of the understanding which here, *i.e.* in time, has no work to perform, the integration being already accomplished.

All this is completely opposed to the earlier part of the *Metaphysics*, where Mansel insists that the Understanding must always co-operate with the intuitive faculty; that intuition and thought, presentation and representation, are never independent. It is also directly opposed to the system of Kant, who maintains that pure time and pure space need their elements to be integrated by the understanding as much as any empirical intuition.

Mansel's theory of the Principle of Causality may, I think, be traced to his rejection of Cause from the Categories; for if the *à priori* intuition, time, is to be determined at all by the understanding, it will be impossible to dispense with Cause in our list of Categories.

2. With regard to the origin of our idea of power in a particular sequence, Mansel's derivation of it is as follows: The only presentation of power we have is our own consciousness of a power of choice when acted on by different motives: this presentation of power we project into the external world—it is, in fact, the sole origin of our idea of power in any sequence (*Metaphysics*, pp. 269, 270).

3. Our belief in the necessity of the relation in this particular sequence is a merely negative necessity, arising from the want of presentation to base the corresponding representation on : being presented with contingency only in relation to consciousness, *i.e.* in our own power of choice, we cannot transfer it to the physical sequence of unconscious objects (*Metaphysics*, pp. 270, 271).

Here Mansel involves himself in a manifest contradiction. In our own consciousness, and there alone, are we presented with power and contingency, both being presented together in the consciousness of our 'Power of Choice.' By an unwarranted bisection of the presented phenomenon, Mansel maintains that we project the presented power into the external world of physical objects without its concomitant consciousness ; and yet, that it is impossible to represent the other half of the same presented phenomenon as belonging to physical events, because it is presented only in connexion with consciousness.

It is plain that if we project power we can equally project contingency—both, or neither : in fact, if Mansel's derivation of the belief in 3 is correct, it should be absolutely impossible for us to represent any power in the relation of antecedent and consequent in physical sequence, or else that we should represent that sequence to be contingent. For example : when the fire melts the wax, if we conceive that it has a power to do so, we must also conceive that it has a power not to do so ; or, if we conceive that it is necessary that the fire should melt the wax, we can only do so by representing to ourselves that it is impossible it should have any power to do so.

In fact, if contingency cannot be represented beyond the sphere of conscious beings because it is presented only in relation to consciousness, the same must be assumed of every other idea which is presented only as an adjunct

of consciousness—a doctrine which is fatal to Mansel's theory of

SUBSTANCE.

Mansel, while admitting that we have no presentation of material substance, maintains that the ordinary belief in such is derived from two sources:—

1. 'No sensible quality can be perceived or *conceived* by itself, but each is necessarily accompanied by an intellectual apprehension of its relation to space as occupying it and contained in it. Colour cannot be conceived without extension' (*Metaphysics*, pp. 262, 263).

This, according to Mansel, is the first source of the idea of a material substratum. The other source is as follows: 'The one presented substance, myself, is the basis of the other notions of substance which are thought representatively in relation to other phenomena.' Again: 'Le moi est la seule unité qui nous soit donnée immédiatement par la nature'; in other words, the presentation of the Substance and Unity of the *Ego* is the presentation on which every other representation of Substance and Unity is to be based (*Metaphysics*, p. 265).

As Mansel separates, as distinct, these two sources of the notion of a material substratum, though a closer examination would have easily shown that they are not distinct, that the first is only a more detailed application of the second to material phenomena, I shall follow him in my criticism.

To consider, then, the first, without reference to the second, the question at once arises: What is the origin of these unities among material phenomena? Where does the grouping come from? Mansel apparently says from association (*Metaphysics*, p. 109), where, he distinctly says, that our inability to conceive extension without colour arises from such. This leaves Mr. Mansel's theory of Sub-

stance identical with that of the Association School ; but as Kant and, more clearly, Mr. Mahaffy, have pointed out, only removes the difficulty a step backwards ; for the association of material phenomena presupposes them to be associable, and therefore postulates a thoroughgoing affinity among them.

In fact, as in the case of Causality, the rejection of Cause from the Categories leads to the doctrine that time and experience in time are given as integrated independently of the Understanding. Here the rejection of the Category Substance leads to a similar result with regard to space and experience in space ; and, as we have no experience or cognition except in time or space, or both, the understanding is, in Mansel's system, an unnecessary excrescence, to be hewed off by the Law of Parcimony ; and return to the most primitive Natural Realism is the legitimate consequence of these theories of Causality and Substance.

To examine Mansel's other source of the idea of Material Substance, *i.e.* that it is derived from the presentation of the *Ego* :

If, as we see Mansel maintains, it is impossible to project choice beyond consciousness, as it is only presented as an attribute of consciousness, it should be equally impossible to project into the world of unconscious objects a Substance and Unity which are merely subjective presentations, even if this Substance and Unity are no more closely connected with consciousness than choice is ; but if we turn to Mansel's theory of the *Ego*, we find (*Metaphysics*, pp. 355, 356) that his presented substance is absolutely identical with consciousness. This he lays down unambiguously. Such a substance cannot possibly be the basis of the representation of an unconscious substratum of material phenomena. This must be assented to whether we agree with his theory of Causality or not ;

hence, instead of the belief in material substance being general (though erroneous), as Mansel admits, it should be absolutely inconceivable that there should be any such substance; inconceivable, also, that there should be any bond of unity or connexion, any groups in fact, of material phenomena.

THE EGO.

In conclusion, I wish to point out one great inconsistency, at least, that Mansel is guilty of in his theory of the *Ego*. The *Ego* being, according to him, nothing but consciousness (*Metaphysics*, pp. 355, 356), what meaning in his system has the doctrine of Latent Mental Modifications? If our existence and selves are the same as our consciousness, a Latent Mental Modification is a contradiction in terms—it is, in fact, a modification of consciousness of which we are unconscious. Yet Mansel adopts this theory in opposition to Stewart's doctrine of consciousness and memory (*Metaphysics*, p. 135). Also, having laid down that 'every act of consciousness as such is given as a change in the state of our existence' (*Metaphysics*, p. 87); and hence, being involved in the difficulty as to how consciousness could have had a commencement, his solution amounts to the assertion that the previous state of existence need not have been a state of consciousness, which, as our consciousness and existence are identical, is a self-contradictory and impossible state.

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GREEK GEOMETRY FROM THALES TO
EUCLID.*

III.

THE first twenty years of the fifth century before the Christian era was a period of deep gloom and despondency throughout the Hellenic world. The Ionians had revolted and were conquered, for the third time; this time, however, the conquest was complete and final: they were overcome by sea as well as by land. Miletus, till then the chief city of Hellas, and rival of Tyre and Carthage, was taken and destroyed; the Phœnician fleet ruled the sea, and the islands of the Ægean became subject to Persia. The fall of Ionia, and the maritime supremacy of the Phœnicians, involving the interruption of Greek commerce, must have exercised a disastrous influence on

* In the former part of this Paper (HERMATHENA, vol. iii. p. 160, note) I acknowledged my obligations to the works of Bretschneider and Hankel: I have again made use of them in the preparation of this part. Since it was written, I have received from Dr. Moritz Cantor, of Heidelberg, the portion of his *History of Mathematics* which treats of the Greeks (*Vorlesungen über Geschichte der Mathematik*, von Moritz Cantor, Erster Band. Von den ältesten Zeiten bis zum Jahre 1200 n. Chr. Leipzig, 1880 (Teubner)). To the list of new editions of ancient

mathematical works given in the note referred to above, I have to add: Theonis Smyrnaei *Expositio rerum Mathematicarum ad legendum Platonem utilium*. Recensuit Eduardus Hiller, Lipsiae, 1878 (Teubner); Pappi Alexandrini *Collectionis quas supersunt*, &c., instruxit F. Hultsch, vol. iii., Berolini, 1878; (to the latter the editor has appended an *Index Graecitatis*, a valuable addition; for as he remarks, 'Mathematicam Graecorum dictionem nemo adhuc in lexicis formam redegit.' Praef., vol. iii., tom. ii.); Archimedis *Opera omnia cum com-*

the cities of Magna Graecia.¹ The events which occurred there after the destruction of Sybaris are involved in great obscurity. We are told that some years after this event there was an uprising of the democracy—which had been repressed under the influence of the Pythagoreans—not only in Crotona, but also in the other cities of Magna Graecia. The Pythagoreans were attacked, and the house in which they were assembled was burned; the whole country was thrown into a state of confusion and anarchy; the Pythagorean Brotherhood was suppressed, and the chief men in each city perished.

The Italic Greeks, as well as the Ionians, ceased to prosper.

Towards the end of this period Athens was in the hands of the Persians, and Sicily was threatened by the Carthaginians. Then followed the glorious struggle; the gloom was dispelled, the war which had been at first defensive became offensive, and the Ægean Sea was cleared of Phœnicians and pirates. A solid basis was thus laid for the development of Greek commerce and for the interchange of Greek thought, and a brilliant period followed—one of the most memorable in the history of the world.

mentarius Eutocii. E codice Florentino recensuit, Latine vertit notisque illustravit J. L. Heiberg, Dr. Phil. Vol. i., Lipsiae, 1880 (Teubner). Since the above was in type, the following work has been published: *An Introduction to the Ancient and Modern Geometry of Conics: being a geometrical treatise on the Conic Sections, with a collection of Problems and Historical Notes, and Prolegomena.* By Charles Taylor, M.A., Fellow of St. John's College, Cambridge. Cambridge, 1881. The matter of the *Prolegomena*, pp. xvii.–lxxxviii.,

is historical.

¹ The names *Ionian Sea*, and *Ionian Isles*, still bear testimony to the intercourse between these cities and Ionia. The writer of the article in Smith's *Dictionary of Geography* thinks that the name *Ionian Sea* was derived from Ionians residing, in very early times, on the west coast of the Peloponnesus. Is it not more probable that it was so called from being the highway of the Ionian ships, just as, now-a-days, in a provincial town we have the *London road*?

Athens now exercised a powerful attraction on all that was eminent in Hellas, and became the centre of the intellectual movement. Anaxagoras settled there, and brought with him the Ionic philosophy, numbering Pericles and Euripides amongst his pupils; many of the dispersed Pythagoreans no doubt found a refuge in that city, always hospitable to strangers; subsequently the Eleatic philosophy was taught there by Parmenides and Zeno. Eminent teachers flocked from all parts of Hellas to the Athens of Pericles. All were welcome; but the spirit of Athenian life required that there should be no secrets, whether confined to priestly families¹ or to philosophic sects: everything should be made public.

In this city, then, geometry was first published; and with that publication, as we have seen, the name of Hippocrates of Chios is connected.

Before proceeding, however, to give an account of the work of Hippocrates of Chios, and the geometers of the fifth century before the Christian era, we must take a cursory glance at the contemporaneous philosophical movement. Proclus makes no mention of any of the philosophers of the Eleatic School in the summary of the history of geometry which he has handed down—they seem, indeed, not to have made any addition to geometry or astronomy, but rather to have affected a contempt for both these sciences—and most writers² on the history of mathematics either take no notice whatever of that School, or merely refer to it as outside their province. Yet the visit of Parmenides and Zeno to Athens (*circa* 450 B.C.), the invention of dialectics by Zeno, and his famous polemic against multiplicity and

¹ *E.g.* the Asclepiadæ. See Curtius, *History of Greece*, Engl. transl., vol. ii. p. 510.

² Not so Hankel, whose views as to the influence of the Eleatic philosophy

I have adopted. See a fine chapter of his *Gesch. der Math.*, pp. 115 *et seq.*, from which much of what follows is taken.

motion, not only exercised an important influence on the development of geometry at that time, but, further, had a lasting effect on its subsequent progress in respect of *method*.⁴

Zeno argued that neither multiplicity nor motion is possible, because these notions lead to contradictory consequences. In order to prove a contradiction in the idea of motion, Zeno argues: 'Before a moving body can arrive at its destination, it must have arrived at the middle of its path; before getting there it must have accomplished the half of that distance, and so on *ad infinitum*: in short, every body, in order to move from one place to another, must pass through an infinite number of spaces, which is impossible.' Similarly he argued that 'Achilles cannot overtake the tortoise, if the latter has got any start, because in order to overtake it he would be obliged first to reach every one of the infinitely many places which the tortoise had previously occupied.' In like manner, 'The flying arrow is always at rest; for it is at each moment only in one place.'

Zeno applied a similar argument to show that the notion of multiplicity involves a contradiction. 'If the manifold exists, it must be at the same time infinitely small and infinitely great—the former, because its last divisions are without magnitude; the latter, on account of the infinite number of these divisions.' Zeno seems to have been unable to see that if $xy = a$, x and y may both

⁴ This influence is noticed by Clairaut, *Elémens de Géométrie*, Pref. p. x., Paris, 1741: 'Qu' Euclide se donne la peine de démontrer, que deux cercles qui se coupent n'ont pas le même centre, qu'un triangle renfermé dans un autre a la somme de ses côtés plus petite que celle des côtés du triangle dans lequel

il est renfermé; on n'en sera pas surpris. Ce Géomètre avoit à convaincre des Sophistes obstinés, qui se faisoient gloire de se refuser aux vérités les plus évidentes: il falloit donc qu'alors la Géométrie eût, comme la Logique, le secours des raisonnemens en forme, pour fermer la bouche à la chicanne.'

vary, and that the number of parts taken may make up for their minuteness.

Subsequently the Atomists endeavoured to reconcile the notions of unity and multiplicity; stability and motion; permanence and change; being and becoming—in short, the Eleatic and Ionic philosophy. The atomic philosophy was founded by Leucippus and Democritus; and we are told by Diogenes Laertius that Leucippus was a pupil of Zeno: the filiation of this philosophy to the Eleatic can, however, be seen independently of this statement. In accordance with the atomic philosophy, magnitudes were considered to be composed of indivisible elements (ἀτόμοι) in finite numbers: and indeed Aristotle—who, a century later, wrote a treatise on *Indivisible Lines* (περὶ ἀτόμων γραμμῶν), in order to show their mathematical and logical impossibility—tells us that Zeno's disputation was taken as compelling such a view.⁵ We shall see, too, that in Antiphon's attempt to square the circle, it is assumed that straight and curved lines are ultimately reducible to the same indivisible elements.⁶

Insuperable difficulties were found, however, in this conception; for no matter how far we proceed with the division, the distinction between the straight and curved still exists. A like difficulty had been already met with in the case of straight lines themselves, for the incommensurability of certain lines had been established by the Pythagoreans. The diagonal of a square, for example, cannot be made up of submultiples of the side, no matter how minute these submultiples may be. It is possible that Democritus may have attempted to get over this difficulty, and reconcile incommensurability with his atomic theory; for we are told by Diogenes Laertius that he

⁵ Arist. *De insecab. lineis*, p. 968, a, ed. Bek.

⁶ Vid. Bretsch., *Geom. vor Eukl.*, p. 101, et *infra*, p. 194.

wrote on incommensurable lines and solids (περὶ ἀλόγων γραμμῶν καὶ ναστῶν).⁷

The early Greek mathematicians, troubled no doubt by these paradoxes of Zeno, and finding the progress of mathematics impeded by their being made a subject of dialectics, seem to have avoided all these difficulties by banishing from their science the idea of the Infinite—the infinitely small as well as the infinitely great (*vid.* Euclid, Book v., Def. 4). They laid down as axioms that any quantity may be divided *ad libitum*; and that, if two spaces are unequal, it is possible to add their difference to itself so often that every finite space can be surpassed.⁸ According to this view, there can be no infinitely small difference which being multiplied would never exceed a finite space.

Hippocrates of Chios, who must be distinguished from his contemporary and namesake, the great physician of Cos, was originally a merchant. All that we know of him is contained in the following brief notices:—

(a). Plutarch tells us that Thales, and Hippocrates the mathematician, are said to have applied themselves to commerce.⁹

(b). Aristotle reports of him: It is well known that persons, stupid in one respect, are by no means so in others (there is nothing strange in this: so Hippocrates, though skilled in geometry, appears to have been in other respects weak and stupid; and he lost, as they say, through his simplicity, a large sum of money by the fraud of the collectors of customs at Byzantium (ὑπὸ τῶν ἐν Βυζαντίῳ πεντηκοστολόγων)).¹⁰

(c). Johannes Philoponus, on the other hand, relates that

⁷ Diog. Laert., ix., 47, ed. Cobet, p. 239.

⁸ *In Vit. Solonis*, ii.

⁹ Archim., *De quadr. parab.*, p. 18, ed. Torelli.

¹⁰ Arist., *Eth. ad Eud.*, vii., c. 14, p. 1247, a, 15, ed. Bek.

Hippocrates of Chios, a merchant, having fallen in with a pirate vessel, and having lost everything, went to Athens to prosecute the pirates, and staying there a long time on account of the prosecution, frequented the schools of the philosophers, and arrived at such a degree of skill in geometry, that he endeavoured to find the quadrature of the circle.¹¹

(d). We learn from Eudemus that Œnopides of Chios was somewhat junior to Anaxagoras, and that after these Hippocrates of Chios, who first found the quadrature of the lune, and Theodorus of Cyrene, became famous in geometry; and that Hippocrates was the first writer of elements.¹²

(e). He also taught, for Aristotle says that his pupils, and those of his disciple Æschylus, expressed themselves concerning comets in a similar way to the Pythagoreans.¹³

(f). He is also mentioned by Iamblichus, along with Theodorus of Cyrene, as having divulged the geometrical *arcana* of the Pythagoreans, and thereby having caused mathematics to advance (ἐπέδωκε δὲ τὰ μαθήματα, ἐπεὶ ἐξευρηθέντων δισσοὶ προαγόντες, μάλιστα Θεόδωρος τε ὁ Κυρηναῖος, καὶ Ἰπποκράτης ὁ Χίος).¹⁴

(g). Iamblichus goes on to say that the Pythagoreans allege that geometry was made public thus: one of the Pythagoreans lost his property; and he was, on account of his misfortune, allowed to make money by teaching geometry.¹⁵

(h). Proclus, in a passage quoted in the former part of this Paper (HERMATHENA, vol. iii. p. 197, note), ascribes to Hippocrates the method of reduction (ἀπαγωγή). Proclus

¹¹ Philoponus, *Comm. in Arist. phys. ausc.*, f. 13. Brand., *Schol. in Arist.*, p. 327, b, 44.

¹² Procl.^a *Comm.*, ed. Fried., p. 66.

¹³ Arist., *Meteor.*, i., 6, p. 342, b,

35, ed. Bek.

¹⁴ Iambl. *de philos. Pythag.* lib. iii; Villoison, *Anecdota Græca*, ii., p. 216.

¹⁵ *Ibid.*; also Iambl. *de Vit. Pyth.* c. 18, s. 89.

defines ἀπαγωγή to be a transition from one problem or theorem to another, which being known or determined, the thing proposed is also plain. For example : when the duplication of the cube is investigated, geometers reduce the question to another to which this is consequent, *i.e.* the finding of two mean proportionals, and afterwards they inquire how between two given straight lines two mean proportionals may be found. But Hippocrates of Chios is reported to have been the first inventor of geometrical reduction (ἀπαγωγή): who also squared the lune, and made many other discoveries in geometry, and who was excelled by no other geometer in his powers of construction.¹⁶

(*ε*). Eratosthenes, too, in his letter to King Ptolemy III. Euergetes, which has been handed down to us by Eutocius, after relating the legendary origin of the celebrated problem of the duplication of the cube, tells us that after geometers had for a long time been quite at a loss how to solve the question, it first occurred to Hippocrates of Chios that if between two given lines, of which the greater is twice the less, he could find two mean proportionals, then the problem of the duplication of the cube would be solved. But thus, Eratosthenes adds, the problem is reduced to another which is no less difficult.¹⁷

(*κ*). Eutocius, in his commentary on Archimedes (*Circ. Dimens. Prop. 1*), tells us that Archimedes wished to show that a circle is equal to a certain rectilineal area, a thing which had been of old investigated by illustrious philosophers.¹⁸ For it is evident that this is the problem concerning which Hippocrates of Chios and Antiphon, who carefully searched after it, invented the false reasonings which, I think, are well known to those who have looked

¹⁶ Procl. *Comm.*, ed. Fried., p. 212.

Oxon. 1792.

¹⁷ Archim., ex recens. Torelli, p. 144,

¹⁸ Anaxagoras, for example.

into the *History of Geometry* of Eudemus and the *Keria* (Κηρίων) of Aristotle.¹⁹

On the passage (*f*) quoted above, from Iamblichus, is based the statement of Montucla, which has been repeated since by recent writers on the history of mathematics,²⁰ that Hippocrates was expelled from a school of Pythagoreans for having taught geometry for money.²¹

There is no evidence whatever for this statement, which is, indeed, inconsistent with the passage (*g*) of Iamblichus which follows. Further, it is even possible that the person alluded to in (*g*) as having been allowed to make money by teaching geometry may have been Hippocrates himself; for—

1. He learned from the Pythagoreans;
2. He lost his property through misfortune;
3. He made geometry public, not only by teaching, but also by being the first writer of the elements.

This misapprehension originated, I think, with Fabricius, who says: ‘De Hippaso Metapontino adscribam adhuc locum Iamblichi è libro tertio de Philosophia Pythagorica Graece necdum edito, p. 64, ex versione Nic. Scutelli: *Hippasus* (videtur legendum Hipparchus) *ejicitur è Pythagorae schola eo quod primus sphaeram duodecim angulorum* (Dodecaedron) *edidisset* (adeoque arcanum hoc evulgasset), *Theodorus etiam Cyrenaeus et Hippocrates Chius Geometra ejicitur*

¹⁹ Archim., ex recens. Torelli, p. 204.

²⁰ Bretsch., *Geom. vor Eukl.*, p. 93; Hoefer, *Histoire des Math.*, p. 135. Since the above was written, this statement has been reiterated by Cantor, *Gesch. der Math.*, p. 172; and by C. Taylor, *Geometry of Conics, Prolegomena*, p. xxviii.

²¹ Montucla, *Histoire des Math.*, tom. i., p. 144, 1^{re} ed. 1758; tom. i., p. 152, nouv. ed. an vii.; the statement is repeated in p. 155 of this edition, and Simplicius is given as the authority for it. Iamblichus is, however, referred to by later writers as the authority for it.

qui ex geometria quaestum factitabant. Confer Vit. Pyth. c. 34 & 35.²²

In this passage Fabricius, who, however, had access to a manuscript only, falls into several mistakes, as will be seen by comparing it with the original, which I give here :—

Περὶ δ' Ἰππασίου λέγουσιν, ὡς ἦν μὲν τῶν Πυθαγορείων, διὰ δὲ τὸ ἐξεργεῖν, καὶ γράψασθαι πρῶτος σφαῖραν, τὴν ἐκ τῶν δώδεκα ἑξαγώνων [πενταγώνων], ἀπόλοιτο κατὰ θάλατταν, ὡς ἀσεβήσας, δόξαν δὲ λάβοι, ὡς εἶναι δὲ πάντα ἐκείνου τοῦ ἀνδρός· προσαγορεύουσι γὰρ οὕτω τὸν Πυθαγόραν, καὶ οὐ καλοῦσιν ὀνόματι. ἐπέδωκε δὲ τὰ μαθήματα, ἐπεὶ ἐξηγητέχθησαν δισσοὶ προαγόντε, μάλιστα Θεόδωρός τε ὁ Κυρηναῖος, καὶ Ἰπποκράτης ὁ Χίος. λέγουσι δὲ οἱ Πυθαγόρειοι ἐξηγητέχθαι γεωμετρίαν οὕτως· ἀποβαλεῖν τινα τὴν οὐσίαν τῶν Πυθαγορείων· ὡς δὲ τοῦτ' ἤτύχησε, δοθῆναι αὐτῷ χρηματίσασθαι ἀπὸ γεωμετρίας· ἐκαλεῖτο δὲ ἡ γεωμετρία πρὸς Πυθαγόρου ἱστορία.²³

Observe that Fabricius, mistaking the sense, says that Hippasus, too, was expelled. Hippocrates may have been expelled by a school of Pythagoreans with whom he had been associated; but, if so, it was not for teaching geometry for money, but for taking to himself the credit of Pythagorean discoveries—a thing of which we have seen the Pythagoreans were most jealous, and which they even looked on as impious (ἀσεβήσας).²⁴

As Anaxagoras was born 499 B. C., and as Plato, after the death of Socrates, 399 B. C., went to Cyrene to hear Theodorus (d), the lifetime of Hippocrates falls within the fifth century before Christ. As, moreover, there could not have been much commerce in the Ægean during the first

²² Jo. Alberti Fabricii *Bibliotheca Graeca*, ed. tertia, i., p. 505, Hamburgi, 1718.

²³ Iambl. *de philos.* Pyth. lib. iii.; Villosion, *Anecdota Graeca*, ii., p. 216. With the exception of the sentence

concerning Hippocrates, the passage, with some modifications, occurs also in Iambl. *de Vit. Pyth.*, c. 18, ss. 88 and 89.

²⁴ See HERMATHENA, vol. iii., p. 199.

quarter of the fifth century, and, further, as the statements of Aristotle and Philoponus (*b*) and (*c*) fall in better with the state of affairs during the Athenian supremacy—even though we do not accept the suggestion of Bretschneider, made with the view of reconciling these inconsistent statements, that the ship of Hippocrates was taken by Athenian pirates²⁵ during the Samian war (440 B.C.), in which Byzantium took part—we may conclude with certainty that Hippocrates did not take up geometry until after 450 B.C. We have good reason to believe that at that time there were Pythagoreans settled at Athens. Hippocrates, then, was probably somewhat senior to Socrates, who was a contemporary of Philolaus and Democritus.

The paralogisms of Hippocrates, Antiphon, and Bryson, in their attempts to square the circle, are referred to and contrasted with one another in several passages of Aristotle²⁶ and of his commentators—Themistius,²⁷ Johan. Philoponus,²⁸ and Simplicius. Simplicius has preserved in his *Comm. to Phys. Ausc.* of Aristotle a pretty full and partly literal extract from the *History of Geometry* of Eudemus, which contains an account of the work of Hippocrates and others in relation to this problem. The greater part of this extract had been almost entirely overlooked by writers on the history of mathematics, until Bretschneider²⁹ republished the Greek text, having carefully revised and emended it. He also supplied the necessary diagrams, some of which were wanting, and added explanatory and

²⁵ Bretsch., *Geom. vor Eukl.*, p. 98. *Schol.*, p. 211, b, 19.

²⁶ *De Sophist. Elench.*, 11, pp. 171, b, and 172, ed. Bek.; *Phys. Ausc.*, i., 2, p. 185, a, 14, ed. Bek.

²⁷ Themist. f. 16, *Schol.* in Arist., Brand., p. 327, b, 33. *Ibid.*, f. 5,

²⁸ Joh. Philop. f. 25, b, *Schol.*, Brand. p. 211, b, 30. *Ibid.*, f. 118, *Schol.*, p. 211, b, 41. *Ibid.*, f. 26, b, *Schol.*, p. 212, a, 16.

²⁹ Bretsch., *Geom. vor Eukl.*, pp. 100–121.

critical notes. This extract is interesting and important, and Bretschneider is entitled to much credit for the pains he has taken to make it intelligible and better known.

It is much to be regretted, however, that Simplicius did not merely transmit *verbatim* what Eudemus related, and thus faithfully preserve this oldest fragment of Greek geometry, but added demonstrations of his own, giving references to the Elements of Euclid, who lived a century and a-half later. Simplicius says: 'I shall now put down literally what Eudemus relates, adding only a short explanation by referring to Euclid's Elements, on account of the summary manner of Eudemus, who, according to archaic custom, gives only concise proofs.'³⁰ And in another place he tells us that Eudemus passed over the squaring of a certain lune as evident—indeed, Eudemus was right in doing so—and supplies a lengthy demonstration himself.³¹

Bretschneider and Hankel, overlooking these passages, and disregarding the frequent references to the Elements of Euclid which occur in this extract, have drawn conclusions as to the state of geometry at the time of Hippocrates which, in my judgment, cannot be sustained. Bretschneider notices the great circumstantiality of the construction, and the long-windedness and the over-elaboration of the proofs.³² Hankel expresses surprise at the fact that this oldest fragment of Greek geometry—150 years older than Euclid's Elements—already bears that character, typically fixed by the latter, which is so peculiar to the geometry of the Greeks.³³

Fancy a naturalist finding a fragment of the skeleton of some animal which had become extinct, but of which there were living representatives in a higher state of

³⁰ Bretsch., *Geom. vor Eukl.*, p. 109.

³¹ *Ibid.*, p. 113.

³² *Ibid.*, pp. 130, 131.

³³ Hankel, *Gesch. der Math.*, p. 112.

development; and fancy him improving the portion of the skeleton in his hands by making additions to it, so that it might be more like the skeleton of the living animal; then fancy other naturalists examining the improved fragment with so little attention as to exclaim: 'Dear me! how strange it is that the two should be so perfectly alike!'

There is, moreover, much clumsiness, and a want of perspicuity, in the arrangement of the demonstrations—the construction not being clearly stated, but being mixed up with the proof: the proofs, too, which in several instances are plainly supplied by Simplicius—inasmuch as propositions of Euclid's Elements are quoted—are unskilful and wearisome on account of the laboured demonstrations of evident theorems, which are repeated several times under different forms: while, on the other hand, some statements and constructions which stand more in need of explanation are passed over without remark. The conclusion is thus forced on us that Simplicius was but a poor geometer; and we have greater reason, therefore, to regret that he was not content with transmitting the work of Eudemus unaltered.

I shall attempt now to restore this fragment by removing from it everything that seems to me not to be the work of Eudemus, and all reference to Euclid's Elements; and by stating briefly, but at the same time clearly and in order, the several steps of each demonstration. I shall also notice the theorems which are made use of, and the problems whose solution is assumed in it.

'The difference between false conclusions that can be proved to be *such*, and others which cannot, he [Aristotle] shows by some false reasonings in geometry.'³⁴ Amongst the many persons who have sought the squaring of the

³⁴ *ψευδογράφημα*, literally a misde- on a faulty diagram.
lineation, a false reasoning founded

circle (that is, to find a square which shall be equal to a circle), both Antiphon and Hippocrates believed that they had found it, and were equally mistaken. Antiphon's mistake, on account of his not having started from geometrical principles, as we shall see, cannot be disproved geometrically. That of Hippocrates, on the other hand, since he was deceived although he clung to geometrical principles, can be disproved geometrically. For we must analyse and examine those reasonings only which, preserving the acknowledged principles of the science, lead thus to further conclusions; but there is no use in examining those in which these principles are set aside.'

'Antiphon, having drawn a circle, inscribed in it one of those polygons²⁶ that can be inscribed: let it be a square. Then he bisected each side of this square, and through the points of section drew straight lines at right angles to them, producing them to meet the circumference; these lines evidently bisect the corresponding segments of the circle. He then joined the new points of section to the ends of the sides of the square, so that four triangles were formed, and the whole inscribed figure became an octagon. And again, in the same way, he bisected each of the sides of the octagon, and drew from the points of bisection perpendiculars; he then joined the points where these perpendiculars met the circumference with the extremities of the octagon, and thus formed an inscribed figure of sixteen sides. Again, in the same manner, bisecting the sides

²⁶ In Greek mathematical writers, τετράγωνον, as far as I know, always means a square. In this oldest geometrical writing, ἑξάγωνον, ὀκτάγωνον, and πολύγωνον denote *regular* hexagon, octagon, and polygon. This is not the case in the Elements of Euclid, who writes, e.g., πεντάγωνον ἰσόπλευ-

ρόν τε καὶ ἰσογώνιον, &c. In Pappus, however, these words, though sometimes used generally, for the most part denote regular figures. The Greeks could do this, for they had the words τετράπλευρον, πεντάπλευρον, &c., for quadrilateral, pentagon, &c.

of the inscribed polygon of sixteen sides, and drawing straight lines, he formed a polygon of twice as many sides; and doing the same again and again, until he had exhausted the surface, he concluded that in this manner a polygon would be inscribed in the circle, the sides of which, on account of their minuteness, would coincide with the circumference of the circle. But we can substitute for each polygon a square of equal surface; therefore we can, since the surface coincides with the circle, construct a square equal to a circle.'

On this Simplicius observes: 'the conclusion here is manifestly contrary to geometrical principles, not, as Alexander maintains, because the geometer supposes as a principle that a circle can touch a straight line in one point only, and Antiphon sets this aside; for the geometer does not suppose this, but proves it. It would be better to say that it is a principle that a straight line cannot coincide with a circumference, for one without meets the circle in one point only, one within in two points, and not more, and the meeting takes place in single points. Yet, by continually bisecting the space between the chord and the arc, it will never be exhausted, nor shall we ever reach the circumference of the circle, even though the cutting should be continued *ad infinitum*: if we did, a geometrical principle would be set aside, which lays down that magnitudes are divisible *ad infinitum*. And Eudemus, too, says that this principle has been set aside by Antiphon.'³⁶

'But the squaring of the circle by means of segments, he [Aristotle^{36*}] says, may be disproved geometrically; he would rather call the squaring by means of lunes, which Hippocrates found out, one by segments, inasmuch as the

³⁶ But Eudemus was a pupil of Aristotle, and Antiphon was a contemporary of Democritus.

^{36*} *Phys. Ausc.* i., 2, p. 185, a, 16, ed. Bek.

lune is a segment of the circle. The demonstration is as follows :—

‘Let a semicircle $a\beta\gamma$ be described on the straight line $a\beta$; bisect $a\beta$ in δ ; from the point δ draw a perpendicular $\delta\gamma$ to $a\beta$, and join $a\gamma$; this will be the side of the square inscribed in the circle of which $a\beta\gamma$ is the semicircle. On $a\gamma$ describe the semicircle $a\epsilon\gamma$. Now, since the square on $a\beta$ is equal to double the square on $a\gamma$ (and since the squares on the diameters are to each other as the respective circles or semicircles), the semicircle $a\gamma\beta$ is double the semicircle $a\epsilon\gamma$. The quadrant $a\gamma\delta$ is, therefore, equal to the semicircle $a\epsilon\gamma$. Take away the common segment lying between the circumference $a\gamma$ and the side of the square; then the remaining lune $a\epsilon\gamma$ will be equal to the triangle $a\gamma\delta$; but this triangle is equal to a square. Having thus shown that the lune can be squared, Hippocrates next tries, by means of the preceding demonstration, to square the circle thus :—

‘Let there be a straight line $a\beta$, and let a semicircle be described on it; take $\gamma\delta$ double of $a\beta$, and on it also describe a semicircle; and let the sides of a hexagon, $\gamma\epsilon$, $\epsilon\zeta$, and $\zeta\delta$ be inscribed in it. On these sides describe the semicircles $\gamma\eta\epsilon$, $\epsilon\theta\zeta$, $\zeta\kappa\delta$. Then each of these semicircles described on the sides of the hexagon is equal to the semicircle $a\beta$, for $a\beta$ is equal to each side of the hexagon. The four semicircles are equal to each other, and together are then four times the semicircle on $a\beta$. But the semicircle on $\gamma\delta$ is also four times that on $a\beta$. The semicircle on $\gamma\delta$ is, therefore, equal to the four semicircles—that on $a\beta$, together with the three semicircles on the sides of the hexagon. Take away from the semicircles on the sides of the hexagon, and from that on $\gamma\delta$, the common segments contained by the sides of the hexagon and the periphery of the semicircle $\gamma\delta$; the remaining lunes $\gamma\eta\epsilon$, $\epsilon\theta\zeta$, and $\zeta\kappa\delta$, together with the semicircle on $a\beta$, will be equal to the

trapezium $\gamma\epsilon$, $\epsilon\zeta$, $\zeta\delta$. If we now take away from the trapezium the excess, that is a surface equal to the lunes (for it has been shown that there exists a rectilineal figure equal to a lune), we shall obtain a remainder equal to the semicircle $a\beta$; we double this rectilineal figure which remains, and construct a square equal to it. That square will be equal to the circle of which $a\beta$ is the diameter, and thus the circle has been squared.

'The treatment of the problem is indeed ingenious; but the wrong conclusion arises from assuming that as demonstrated generally which is not so; for not every lune has been shown to be squared, but only that which stands over the side of the square inscribed in the circle; but the lunes in question stand over the sides of the inscribed hexagon. The above proof, therefore, which pretends to have squared the circle by means of lunes, is defective, and not conclusive, on account of the false-drawn figure ($\psiευδογραφημα$) which occurs in it.'

'Eudemus,³⁷ however, tells us in his *History of Geometry*, that Hippocrates demonstrated the quadrature of the lune, not merely the lune on the side of the square, but generally, if one might say so: if, namely, the exterior arc of the lune be equal to a semicircle, or greater or less than it. I shall now put down literally ($\kappaατὰ λῆξιν$)³⁸ what Eudemus relates, adding only a short explanation by referring to Euclid's Elements, on account of the summary manner of Eudemus, who, according to archaic custom, gives concise proofs.

'In the second book of his *History of Geometry*, Eudemus says: the squaring of lunes seeming to relate to an un-

³⁷ I attribute the above observation on the proof to Eudemus. What follows in Simplicius seems to me not to be his. I have, therefore, omitted the remainder of § 83, and §§ 84, 85, pp.

105-109, Bretsch., *Geom. vor Eukl.*

³⁸ *Ibid.*, p. 109.

³⁹ Simplicius did not adhere to his intention, or else some transcriber has added to the text.

common class of figures was, on account of their relation to the circle, first treated of by Hippocrates, and was rightly viewed in that connection. We may, therefore, more fully touch upon and discuss them. He started with and laid down as the first thing useful for them, that similar segments of circles have the same ratio as the squares on their bases. This he proved by showing that circles have the same ratio as the squares on their diameters. Now, as circles are to each other, so are also similar segments; but similar segments are those which contain the same part of their respective circles, as a semicircle to a semicircle, the third part of a circle to the third part of another circle.⁴⁰ For which reason, also, similar segments contain equal angles. The latter are in all semicircles right, in larger segments less than right angles, and so much less as the segments are larger than semicircles; and in smaller segments they are larger than right angles, and so much larger as the segments are smaller than semicircles. Having first shown this, he described a lune which had a semicircle for boundary, by circumscribing a semicircle about a right-angled isosceles triangle, and describing on the hypotenuse a seg-

⁴⁰ Here *τμήμα* seems to be used for sector: indeed, we have seen above that a lune was also called *τμήμα*. The word *τομέυς*, sector, may have been of later origin. The poverty of the Greek language in respect of geometrical terms has been frequently noticed. For example, they had no word for radius, and instead used the periphrasis *ἡ ἐκ τοῦ κέντρου*. Again, Archimedes nowhere uses the word parabola; and as to the imperfect terminology of the geometers of this period, we have the direct statement of Aristotle, who says: *καὶ τὸ ἀνάλωγον*

ὅτι ἐναλλάξ, ἢ ἀριθμοὶ καὶ ἢ γραμμαὶ καὶ ἢ στερεὰ καὶ ἢ χρόνοι, ὅσπερ ἐδείκνυτό ποτε χωρὶς, ἀνδεχόμενόν γε κατὰ πάντων μιᾷ ἀποδείξει δειχθῆναι ἀλλὰ διὰ τὸ μὴ εἶναι ὀνομασμένον τι πάντα ταῦτα ἐν, ἀριθμοὶ μήκη χρόνος στερεὰ, καὶ εἶδει διαφέρειν ἀλλήλων, χωρὶς ἐλαμβάνετο. *νῦν δὲ καθόλου δείκνυται* οὐ γὰρ ἢ γραμμαὶ ἢ ἢ ἀριθμοὶ ὑπῆρχεν, ἀλλ' ἢ τοῦ, δ καθόλου ὑποτίθεται ὑπάρχειν.—Aristot., *Anal., post.*, i., 5, p. 74, a, 17, ed. Bekker. This passage is interesting in another respect also, as it contains the germ of Algebra.

ment of a circle similar to those cut off by the sides. The segment over the hypotenuse then being equal to the sum of those on the two other sides, if the common part of the triangle which lies over the segment on the base be added to both, the lune will be equal to the triangle. Since the lune, then, has been shown to be equal to a triangle, it can be squared. Thus, then, Hippocrates, by taking for the exterior arc of the lune that of a semicircle, readily squares the lune.

‘Hippocrates next proceeds to square a lune whose exterior arc is greater than a semicircle. In order to do so, he constructs a trapezium⁴¹ having three sides equal to each other, and the fourth—the greater of the two parallel sides—such that the square on it is equal to three times that on any other side; he circumscribes a circle about the trapezium, and on its greatest side describes a segment of a circle similar to those cut off from the circle by the three equal sides.⁴² By drawing a diagonal of the trapezium, it will be manifest that the section in question is greater than a semicircle, for the square on this straight line subtending two equal sides of the trapezium must be greater than twice the square on either of them, or than double the square on the third equal side: the square on the greatest side of the trapezium, which is equal to three times the square on any one of the other sides, is therefore less than the square on the diagonal and the square on the third equal side. Consequently, the angle subtended by

⁴¹ Trapezia, like this, cut off from an isosceles triangle by a line parallel to the base, occur in the Papyrus Rhind.

⁴² Then follows a proof, which I have omitted, that the circle can be circumscribed about the trapezium. This proof is obviously supplied by Simplicius, as is indicated by the change of

person from *ἰσοπλευρῶν* to *ἰσὺς*, as well as by the reference to Euclid, i. 9. A few lines lower there is a gap in the text, as Bretschneider has observed; but the gap occurs in the work of Simplicius, and not of Eudemus, as Bretschneider has erroneously supposed.—*Geom. vor Eukl.*, p. 111, and note.

the greatest side of the trapezium is acute, and the segment which contains it is, therefore, greater than a semicircle: but this is the exterior boundary of the lune. Simplicius tells us that Eudemus passed over the squaring of this lune, he supposes, because it was evident, and he supplies it himself.⁴³

‘Further, Hippocrates shows that a lune with an exterior arc less than a semicircle can be squared, and gives the following construction for the description of such a lune:—

‘Let $\alpha\beta$ be the diameter of a circle whose centre is κ ; let $\gamma\delta$ cut $\beta\kappa$ in the point of bisection γ , and at right angles; through β draw the straight line $\beta\zeta\epsilon$, so that the part of it, $\zeta\epsilon$, intercepted between the line $\gamma\delta$ and the circle shall be such that two squares on it shall be equal to three squares on the radius $\beta\kappa$;’⁴⁴ join $\kappa\zeta$, and produce it to meet the

⁴³ *Ibid.*, p. 113, § 88. I have omitted it, as not being the work of Eudemus.

⁴⁴ The whole construction, as Bretschneider has remarked, is quite obscure and defective. The main point on which the construction turns is the determination of the straight line $\beta\zeta\epsilon$, and this is nowhere given in the text. The determination of this line, however, can be inferred from the statement in p. 114, *Geom. vor Eukl.*, that ‘it is assumed that the line $\epsilon\zeta$ inclines towards β ’; and the further statement, in p. 117, that ‘it is assumed that the square on $\epsilon\zeta$ is once and a-half the square on the radius.’ In order to make the investigation intelligible, I have commenced by stating how this line $\beta\zeta\epsilon$ is to be drawn. I have, as usual, omitted the proofs of Simplicius.

Bretschneider, p. 114, notices the archaic manner in which lines and points are denoted in this investiga-

tion— η [$\epsilon\theta\epsilon\iota\alpha$] $\epsilon\phi'$ η AB, $\tau\delta$ [$\sigma\eta\mu\epsilon\iota\sigma\tau\epsilon\iota$] $\epsilon\phi'$ $\alpha\delta$ K—and infers from it that Eudemus is quoting the very words of Hippocrates. I have found this observation useful in aiding me to separate the additions of Simplicius from the work of Eudemus. The inference of Bretschneider, however, cannot I think be sustained, for the same manner of expression is to be found in Aristotle.

⁴⁵ The length of the line $\epsilon\zeta$ can be determined by means of the theorem of Pythagoras (Euclid, i., 47), coupled with the theorem of Thales (Euclid, iii., 31). Then, produce the line $\epsilon\zeta$ thus determined, so that the rectangle under the whole line thus produced and the part produced shall be equal to the square on the radius; or, in archaic language, apply to the line $\epsilon\zeta$ a rectangle which shall be equal to the square on the radius, and which shall be *excessive* by a square—a Pytha-

straight line drawn through ϵ parallel to $\beta\kappa$, and let them meet at η ; join $\kappa\epsilon$, $\beta\eta$ (these lines will be equal); describe then a circle round the trapezium $\beta\kappa\epsilon\eta$; also, circumscribe a circle about the triangle $\epsilon\zeta\eta$. Let the centres of these circles be λ and μ respectively.

'Now, the segments of the latter circle on $\epsilon\zeta$ and $\zeta\eta$ are similar to each other, and to each of the segments of the former circle on the equal straight lines $\epsilon\kappa$, $\kappa\beta$, $\beta\eta$;⁴⁶ and, since twice the square on $\epsilon\zeta$ is equal to three times the square on $\kappa\beta$, the sum of the two segments on $\epsilon\zeta$ and $\zeta\eta$ is equal to the sum of the three segments on $\epsilon\kappa$, $\kappa\beta$, $\beta\eta$; to each of these equals add the figure bounded by the straight lines $\epsilon\kappa$, $\kappa\beta$, $\beta\eta$, and the arc $\eta\zeta\epsilon$, and we shall have the lune whose exterior arc is $\epsilon\kappa\beta\eta$ equal to the rectilinear figure composed of the three triangles $\zeta\beta\eta$, $\zeta\beta\kappa$, $\zeta\kappa\epsilon$.⁴⁷

gorean problem, as Eudemus tells us. (See HERMATHENA, vol. iii., pp. 181, 196, 197.) If the calculation be made by this method, or by the solution of a quadratic equation, we find

$$\beta\epsilon = \frac{\beta\kappa}{2} \left(\sqrt{\frac{3}{2}} + \sqrt{\frac{11}{2}} \right).$$

Bretschneider makes some slip, and gives

$$\epsilon\beta = \frac{\beta\kappa}{2} \left(\sqrt{\frac{11}{3}} - 1 \right).$$

Geom. vor Eukl., p. 115, note.

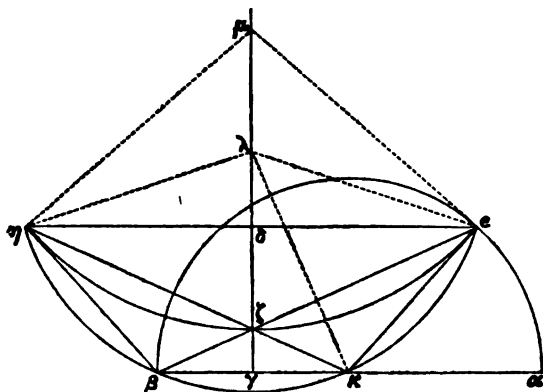
⁴⁶ Draw lines from the points ϵ , κ , β , and η to λ , the centre of the circle described about the trapezium; and from ϵ and η to μ , the centre of the circle circumscribed about the triangle $\epsilon\zeta\eta$; it will be easy to see, then, that the angles subtended by $\epsilon\kappa$, $\kappa\beta$, and $\eta\beta$ at λ are equal to each other, and to each of the angles subtended by $\epsilon\zeta$ and $\zeta\eta$ at μ . The similarity of the segments is then inferred; but observe, that in

order to bring this under the definition of similar segments given above, the word *segment* must be used in a large signification; and that further, it requires rather the converse of the definition, and thus raises the difficulty of incommensurability.

The similarity of the segments might also be inferred from the equality of the alternate angles ($\epsilon\eta\zeta$ and $\eta\kappa\beta$, for example). In HERMATHENA, vol. iii., p. 203, I stated, following Bretschneider and Hankel, that Hippocrates of Chios did not know the theorem that the angles in the same segment of a circle are equal. But if the latter method of proving the similarity of the segments in the construction to which the present note refers was that used by Hippocrates, the statement in question would have to be retracted.

⁴⁷ A pentagon with a re-entrant angle is considered here: but observe, 1^o, that it is not called a pentagon, that term being then restricted to the regular

‘That the exterior arc of this lune is smaller than a semicircle, Hippocrates proves, by showing that the angle $\epsilon\kappa\eta$ lying within the exterior arc of the segment is obtuse, which he does thus: Since the square on $\epsilon\zeta$ is once and a-half the square on the radius $\beta\kappa$ or $\kappa\epsilon$, and since, on account of the similarity of the triangles $\beta\kappa\epsilon$ and $\beta\zeta\kappa$, the square on $\kappa\epsilon$ is greater than twice the square on $\kappa\zeta$,⁴⁶ it follows that the square on $\epsilon\zeta$ is greater than the squares on $\epsilon\kappa$ and $\kappa\zeta$ together. The angle $\epsilon\kappa\eta$ is therefore obtuse, and consequently the segment in which it lies is less than a semicircle.



‘Lastly, Hippocrates squared a lune and a circle together, thus: let two circles be described about the centre κ , and let the square on the diameter of the exterior be six times that of the interior. Inscribe a hexagon $\alpha\beta\gamma\delta\epsilon\zeta$ in the inner circle, and draw the radii $\kappa\alpha$, $\kappa\beta$, $\kappa\gamma$, and produce

pentagon; and, 2^o, that it is described as a rectilineal figure composed of three triangles.

⁴⁶ It is assumed here that the angle $\beta\kappa\epsilon$ is obtuse, which it evidently is.

Bretschneider points out that in this paragraph the Greek text in the Aldine is corrupt, and consequently obscure: he corrects it by means of some transpositions and a few trifling additions. (See *Geom. vor Eukl.*, p. 118, note 2.)

them to the periphery of the exterior circle; let them meet it at the points η , θ , ι , respectively, and join $\eta\theta$, $\theta\iota$, $\eta\iota$. It is evident that $\eta\theta$, $\theta\iota$ are sides of the hexagon inscribed in the larger circle. Now, on $\eta\iota$ let there be described a segment similar to that cut off by $\eta\theta$. Since, then, the square on $\eta\iota$ is necessarily three times greater than that on $\eta\theta$, the side of the hexagon,⁴⁰ and the square on $\eta\theta$ six times that on $\alpha\beta$, it is evident that the segment described over $\eta\iota$ must be equal to the sum of the segments of the outer circle over $\eta\theta$ and $\theta\iota$, together with those cut off in the inner circle by all the sides of the hexagon. If we now add, on both sides, the part of the triangle $\eta\theta\iota$ lying over the segment $\eta\iota$, we arrive at the result that the triangle $\eta\theta\iota$ is equal to the lune $\eta\theta\iota$, together with the segments of the inner circle cut off by the sides of the hexagon; and if we add on both sides the hexagon itself, we have the triangle, together with the hexagon, equal to the said lune together with the interior circle. Since, then, these rectilineal figures can be squared, the circle, together with the lune, can also be squared.

'Simplicius adds, in conclusion, that it must be admitted that Eudemus knows better all about Hippocrates of Chios, being nearer to him in point of time, and being also a pupil of Aristotle.'

If we examine this oldest fragment of Greek geometry, we see, in the first place, that there is in it a definition of similar segments of circles; they are defined to be those which contain the same quatum of their respective circles, as, for instance, a semicircle is similar to a semi-

⁴⁰ Then follows the proof of this statement, which I have omitted, as I think it was added by Simplicius: the word $\delta\omegaρε\iota\sigma\tau\epsilon\rho\alpha$ could scarcely have been used by Eudemus in the sense of sub-tense, as it is in this passage.

Plato (Timæus, 54, D, ed. Stallbaum, vii., p. 228) and Aristotle use it, as we do, for the hypotenuse. It was sometimes used by later writers, Pappus for example, more generally, as it is here.

circle, the third part of one circle is similar to the third part of another circle.

Next we find the following theorems :—

(a). Similar segments contain equal angles ;⁵⁰

(b). These in all semicircles are right ; segments which are larger or smaller than semicircles contain, respectively, acute or obtuse angles ;

(c). The side of a hexagon inscribed in a circle is equal to the radius ;

(d). In any triangle the square on a side opposite to an acute angle is less than the sum of the squares on the sides which contain the acute angle ;

(e). In an obtuse-angled triangle the square on the side subtending the obtuse angle is greater than the sum of the squares on the sides containing it ;

(f). In an isosceles triangle whose vertical angle is double the angle of an equilateral triangle, the square on the base is equal to three times the square on one of the equal sides ;

(g). In equiangular triangles the sides about the equal angles are proportional ;

(h). Circles are to each other as the squares on their diameters ;

(i). Similar segments of circles are to each other as the squares on their bases.

Lastly, we observe that the solution of the following problems is required :—

(a). Construct a square which shall be equal to a given rectilineal figure ;

(b). Find a line the square on which shall be equal to three times the square on a given line ;⁵¹

⁵⁰ For this, or rather its converse, is assumed in the demonstration, p. 200.

Also, see p. 197.

⁵¹ See theorem (f), *supra*.

(c). Find a line such that twice the square on it shall be equal to three times the square on a given line ;

(d). Being given two straight lines, construct a trapezium such that one of the parallel sides shall be equal to the greater of the two given lines, and each of the three remaining sides equal to the less ;

(e). About the trapezium so constructed describe a circle ;

(f). Describe a circle about a given triangle ;

(g). From the extremity of the diameter of a semicircle draw a chord such that the part of it intercepted between the circle and a straight line drawn at right angles to the diameter at the distance of one half the radius shall be equal to a given straight line ;

(h). Describe on a given straight line a segment of a circle which shall be similar to a given one.

There remain to us but few more notices of the work done by the geometers of this period :—

Antiphon, whose attempt to square the circle is given by Simplicius in the above extract, and who is also mentioned by Aristotle and some of his other commentators, is most probably the Sophist of that name who, we are told, often disputed with Socrates.⁵² It appears from a notice of Themistius, that Antiphon started not only from the square, but also from the equilateral triangle, inscribed in a circle, and pursued the method and train of reasoning above described.⁵³

Aristotle and his commentators mention another Sophist who attempted to square the circle—Bryson, of whom we have no certain knowledge, but who was probably a Pythagorean, and may have been the Bryson who is mentioned by Iamblichus amongst the disciples of Py-

⁵² Xenophon, *Memorab.* i., 6, § 1 ;
Diog. Laert. ii., 46, ed. Cobet, p. 44.

⁵³ Themist., f. 16 ; Brandis, *Schol.*
in *Arist.*, p. 327, b, 33.

thagoras.⁵⁴ Bryson inscribed a square,⁵⁵ or more generally any polygon,⁵⁶ in a circle, and circumscribed another of the same number of sides about the circle; he then argued that the circle is larger than the inscribed and less than the circumscribed polygon, and erroneously assumed that the excess in one case is equal to the defect in the other; he concluded thence that the circle is the mean between the two.

It seems, too, that some persons who had no knowledge of geometry took up the question, and fancied, as Alexander Aphrodisius tells us, that they should find the square of the circle in surface measure if they could find a square number which is also a cyclical number⁵⁷—numbers as 5 or 6, whose square ends with the same number, are called by arithmeticians cyclical numbers.⁵⁸ On this Hankel observes that ‘unfortunately we cannot assume that this solution of the squaring of the circle was only a joke’; and he adds, in a note, that ‘perhaps it was of later origin, although it strongly reminds us of the Sophists who proved also that Homer’s poetry was a geometrical figure because it is a circle of myths.’⁵⁹

That the problem was one of public interest at that time, and that, further, owing to the false solutions of pretended geometers, an element of ridicule had become attached to it, is plain from the reference which Aristophanes makes to it in one of his comedies.⁶⁰

In the former part of this Paper (HERMATHENA, vol. iii. p. 185), we saw that there was a tradition that the problem of the quadrature of the circle engaged the attention of the

⁵⁴ Iambl., *Vit. Pyth.*, c. 23.

⁵⁵ Alex. Aphrod., f. 30; Brandis, *Schol.*, p. 306, b.

⁵⁶ Themist., f. 5; Brandis, *Schol.*, p. 211; Johan. Philop., f. 118; Brandis, *Schol.*, p. 211.

⁵⁷ Simplicius, in Bretsch. *Geom. vor Eukl.*, p. 106.

⁵⁸ *Ibid.*

⁵⁹ Hankel, *Geschich. der Math.*, p. 116, and note.

⁶⁰ *Birds*, 1005.

Pythagoreans. We saw, too (*ibid.* p. 203), that they probably derived the problem from the Egyptians, who sought to find from the diameter the side of a square whose area should be equal to that of the circle. From their approximate solution, it follows that the Egyptians must have assumed as evident that the area of a circle is proportional to the square on its diameter, though they would not have expressed themselves in this abstract manner. Anaxagoras (499–428 B.C.) is recorded to have investigated this problem during his imprisonment.⁶¹

Vitruvius tells us that Agatharchus invented scene-painting, and that he painted a scene for a tragedy which Æschylus brought out at Athens, and that he left notes on the subject. Vitruvius goes on to say that Democritus and Anaxagoras, profiting by these instructions, wrote on perspective.⁶²

We have named Democritus more than once: it is remarkable that the name of this great philosopher, who was no less eminent as a mathematician,⁶³ and whose fame stood so high in antiquity, does not occur in the summary of the history of geometry preserved by Proclus. In connection with this, we should note that Aristoxenus, in his *Historic Commentaries*, says that Plato wished to burn all the writings of Democritus that he was able to collect; but that the Pythagoreans, Amyclas and Cleinias, prevented him, as they said it would do no good, inasmuch as copies of his books were already in many hands. Diogenes Laertius goes on to say that it is plain that this was the case; for Plato, who mentions nearly all the ancient philosophers, nowhere speaks of Democritus.⁶⁴

⁶¹ 'Αλλ' Ἀναξαγόρας μὲν ἐν τῷ δεσμοτηρίῳ τὸν τοῦ κύκλου τετραγωνισμὸν ἔγραφε.—Plut., *De Exil.*, c. 17, vol. iii., p. 734, ed. Didot.

⁶² *De Arch.*, vii., Præf.

⁶³ Cicero, *De finibus bonorum et malorum*, i., 6; Diog. Laert., ix., 7, ed. Cobet, p. 236.

⁶⁴ Diog. Laert., *ibid.*, ed. Cobet, p. 237.

We are also told by Diogenes Laertius that Democritus was a pupil of Leucippus and of Anaxagoras, who was forty years his senior;⁶⁵ and further, that he went to Egypt to see the priests there, and to learn geometry from them.⁶⁶

This report is confirmed by what Democritus himself tells us: 'I have wandered over a larger portion of the earth than any man of my time, inquiring about things most remote; I have observed very many climates and lands, and have listened to very many learned men; but no one has ever yet surpassed me in the construction of lines with demonstration; no, not even the Egyptian Harpedonaptae, as they are called (καὶ γραμμάτων συνθέσιος μετὰ ἀποδείξιος οὐδείς κώ με παρήλλαξε, οὐδ' οἱ Αἰγυπτίων καλεόμενοι Ἀρπεδονάπται), with whom I lived five years in all, in a foreign land.'⁶⁷

We learn further, from Diogenes Laertius, that Democritus was an admirer of the Pythagoreans; that he seems to have derived all his doctrines from Pythagoras, to such a degree, that one would have thought that he had been his pupil, if the difference of time did not prevent it; that at all events he was a pupil of some of the Pythagorean schools, and that he was intimate with Philolaus.⁶⁸

Diogenes Laertius gives a list of his writings: amongst those on mathematics we observe the following:—

Περὶ διαφορῆς γνώμονος ἢ περὶ ψαύσιος κύκλου καὶ σφαίρης (lit., On the difference of the gnomon, or on the contact of the circle and the sphere. Can what he has in view be the following idea: that, the gnomon, or carpenter's rule, being placed with its vertex on the circumference of a circle, in the limiting position, when one leg passes

⁶⁵ Diog. Laert., ix., 7, ed. Cobet, i., p. 304, ed. Sylburg; Mullach, *Fragm. Phil. Graec.*, p. 370.

⁶⁶ *Ibid.*, p. 236.

⁶⁷ Democrit., ap. Clem. Alex. *Strom.*, p. 236.

through the centre, the other will determine the tangent?); one on geometry; one on numbers; one on incommensurable lines and solids, in two books; 'Ἀκτινογραφία (a description of rays, probably perspective).⁶⁹

We also learn, from a notice of Plutarch, that Democritus raised the following question: 'If a cone were cut by a plane parallel to its base [obviously meaning, what we should now call one infinitely near to that plane], what must we think of the surfaces of the sections, that they are equal or unequal? For if they are unequal, they will show the cone to be irregular, as having many indentations like steps, and unevennesses; and if they are equal, the sections will be equal, and the cone will appear to have the property of a cylinder, viz., to be composed of equal, and not unequal, circles, which is very absurd.'⁷⁰

If we examine the contents of the foregoing extracts, and compare the state of geometry as presented to us in them with its condition about half a century earlier, we observe that the chief progress made in the interval concerns the circle. The early Pythagoreans seem not to have given much consideration to the properties of the circle; but the attention of the geometers of this period was naturally directed to them in connection with the problem of its quadrature.

We have already set down, *seriatim*, the theorems and problems relating to the circle which are contained in the extract from Eudemus.

Although the attempts of Antiphon and Bryson to square the circle did not meet with much favour from the ancient geometers, and were condemned on account of the paralogisms in them, yet their conceptions contain the first germ of the infinitesimal method: to Antiphon is due

⁶⁹ Diog. Laert., ix., 7, ed. Cobet, pp. 238 and 239.

⁷⁰ Plut., *de Comm. Not.*, p. 1321, ed. Didot.

the merit of having first got into the right track by introducing for the solution of this problem—in accordance with the atomic theory then nascent—the fundamental idea of infinitesimals, and by trying to exhaust the circle by means of inscribed polygons of continually increasing number of sides; Bryson is entitled to praise for having seen the necessity of taking into consideration the circumscribed as well as the inscribed polygon, and thereby obtaining a superior as well as an inferior limit to the area of the circle. Bryson's idea is just, and should be regarded as complementary to the idea of Antiphon, which it limits and renders precise. Later, after the method of exhaustions had been invented, in order to supply demonstrations which were perfectly rigorous, the two limits, inferior and superior, were always considered together, as we see in Euclid and Archimedes.

We see, too, that the question which Plutarch tells us that Democritus himself raised involves the idea of infinitesimals; and it is evident that this question, taken in connection with the axiom in p. 185, must have presented real difficulties to the ancient geometers. The general question which underlies it was, as is well known, considered and answered by Leibnitz: 'Caeterum aequalia esse puto, non tantum quorum differentia est omnino nulla, sed et quorum differentia est incomparabiliter parva; et licet ea Nihil omnino dici non debeat, non tamen est quantitas comparabilis cum ipsis, quorum est differentia. Quemadmodum si lineae punctum alterius lineae addas, vel superficiei lineam, quantitatem non auges. Idem est, si lineam quidem lineae addas, sed incomparabiliter minorem. Nec ulla constructione tale augmentum exhiberi potest. Scilicet eas tantum homogeneas quantitates comparabiles esse, cum *Euclide, lib. v., defin. 5*, censeo, quarum una numero, sed finito, multiplicata, alteram superare potest. Et quae tali quantitate non differunt, aequalia esse statuo,

quod etiam *Archimedes* sumsit, aliique post ipsum omnes. Et hoc ipsum est, quod dicitur differentiam esse data quavis minorem. Et *Archimedeo* quidem processu res semper deductione ad absurdum confirmari potest.⁷¹ Further, we have seen that Democritus wrote on the contact of the circle and of the sphere. The employment of the *gnomon* for the solution of this problem seems to show that Democritus, in its treatment, made use of the infinitesimal method; he might have employed the *gnomon* either in the manner indicated above, or, by making one leg of the *gnomon* pass through the centre of the circle, and moving the other parallel to itself, he could have found the middle points of a system of parallel chords, and thus ultimately the tangents parallel to them. At any rate this problem was a natural subject of inquiry for the chief founder of the atomic theory, just as Leibnitz—the author of the doctrine of monads and the founder of the infinitesimal calculus—was occupied with this same subject of tangency.

We observe, further, that the conception of the irrational (*ἄλογον*), which had been a secret of the Pythagorean school, became generally known, and that Democritus wrote a treatise on the subject.

We have seen that Anaxagoras and Democritus wrote on perspective, and that this is not the only instance in which the consideration of problems in geometry of three dimensions occupied the attention of Democritus.

On the whole, then, we find that considerable progress had been made in elementary geometry; and indeed the appearance of a treatise on the elements is in itself an indication of the same thing. We have further evidence of this, too, in the endeavours of the geometers of this period to extend to the circle and to volumes the results

⁷¹ Leibnitii *Opera Omnia*, ed. L. Dutens, tom. iii. p. 328.

ies. which had been arrived at concerning rectilineal figures
ata and their comparison with each other. The Pythagoreans,
res as we have seen, had shown how to determine a square
.71 whose area was any multiple of a given square. The
he question now was to extend this to the cube, and, in
ent particular, to solve the problem of the duplication of the
to cube.

he Proclus (after Eudemus) and Eratosthenes tell us (*h* and
he p. 187) that Hippocrates reduced this question to one of
by plane geometry, namely, the finding of two mean propor-
of tionals between two given straight lines, the greater of
he which is double the less. Hippocrates, therefore, must
le have known that if four straight lines are in continued
n. proportion, the first has the same ratio to the fourth that
ry the cube described on the first as side has to the cube
tz described in like manner on the second. He must then
of have pursued the following train of reasoning:—Suppose
1e the problem solved, and that a cube is found which is
a- double the given cube; find a third proportional to the
n sides of the two cubes, and then find a fourth proportional
is to these three lines; the fourth proportional must be double
the side of the given cube: if, then, two mean propor-
tionals can be found between the side of the given cube
e and a line whose length is double of that side, the problem
1 will be solved. As the Pythagoreans had already solved
e the problem of finding a mean proportional between two
given lines—or, which comes to the same, to construct a
square which shall be equal to a given rectangle—it was
not unreasonable for Hippocrates to suppose that he had
put the problem of the duplication of the cube in a fair
way of solution. Thus arose the famous problem of finding
two mean proportionals between two given lines—a prob-
lem which occupied the attention of geometers for many
centuries. Although, as Eratosthenes observed, the diffi-
culty is not in this way got over; and although the new

problem cannot be solved by means of the straight line and circle, or, in the language of the ancients, cannot be referred to plane problems, yet Hippocrates is entitled to much credit for this reduction of a problem in stereometry to one in plane geometry. The tragedy to which Eratosthenes refers in this account of the legendary origin of the problem is, according to Valckenaer, a lost play of Euripides, named Πολυείδος:⁷² if this be so, it follows that this problem of the duplication of the cube, as well as that of the quadrature of the circle, was famous at Athens at this period.

Eratosthenes, in his letter to Ptolemy III., relates that one of the old tragic poets introduced Minos on the stage erecting a tomb for his son Glaucus; and then, deeming the structure too mean for a royal tomb, he said ‘double it, but preserve the cubical form’: μικρόν γ’ ἔλεξας βασιλικοῦ σηκὸν τάφου, διπλάσιος ἔστω. τοῦ δὲ τοῦ κύβου μὴ σφαλῆς.⁷³ Eratosthenes then relates the part taken by Hippocrates of Chios towards the solution of this problem as given above (p. 187), and continues: ‘Later [in the time of Plato], so the story goes, the Delians, who were suffering from a pestilence, being ordered by the oracle to double one of their altars, were thus placed in the same difficulty. They sent therefore to the geometers of the Academy, entreating them to solve the question.’ This problem of the duplication of the cube—henceforth known as the *Delian Problem*—may have been originally suggested by the practical needs of architecture, as indicated in the legend, and have arisen in Theocratic times; it

⁷² See Reimer, *Historia problematis de cubi duplicatione*, p. 20, Gottingae, 1798; and Biering, *Historia problematis cubi duplicandi*, p. 6, Hauniae, 1844.

⁷³ Archim., ed. Torelli, p. 144. Val-

ckenaer shows that these words of Eratosthenes contain two verses, which he thus restores:—

Μικρόν γ’ ἔλεξας βασιλικοῦ σηκὸν τάφου·
Διπλάσιος ἔστω, τοῦ κύβου δὲ μὴ σφαλῆς.

See Reimer, *l. c.*

may subsequently have engaged the attention of the Pythagoreans as an object of theoretic interest and scientific inquiry, as suggested above.

These two ways of looking at the question seem suited for presenting it to the public on the one hand and to mathematical pupils on the other. From the consideration of a passage in Plutarch,⁷⁴ however, I am led to believe that the new problem—to find two mean proportionals between two given lines—which arose out of it, had a deeper significance, and that it must have been regarded by the Pythagorean philosophers of this time as one of great importance, on account of its relation to their cosmology.

In the former part of this Paper (HERMATHENA, vol. iii. p. 194) we saw that the Pythagoreans believed that the tetrahedron, octahedron, icosahedron, and cube corresponded to the four elements of the real world. This doctrine is ascribed by Plutarch to Pythagoras himself;⁷⁵ Philolaus, who lived at this time, also held that the elementary nature of bodies depended on their form. The tetrahedron was assigned to fire, the octahedron to air, the icosahedron to water, and the cube to earth; that is to say, it was held that the smallest constituent parts of these substances had each the form assigned to it.⁷⁶ This being so, what took place, according to this theory, when, under the action of heat, snow and ice melted, or water became vapour? In the former case, the elements which had been cubical took the icosahedral form, and

⁷⁴ *Symp.*, viii., *Quaestio* 2, c. 4; Plut. *Opera*, ed. Didot, vol. iv., p. 877.

⁷⁵ Πυθαγόρας, πάντα σχημάτων ὄντων στερεῶν, ἀπὲρ καλεῖται καὶ μαθηματικά, ἐκ μὲν τοῦ κύβου φησὶ γεγονέναι τὴν γῆν, ἐκ δὲ τῆς πυραμίδος τὸ πῦρ, ἐκ δὲ τοῦ ὀκταέδρου τὸν ἀέρα, ἐκ δὲ τοῦ εἰκοσαέδρου τὸ ὕδωρ, ἐκ δὲ τοῦ δωδεκαέδρου

τὴν τοῦ παντὸς σφαῖραν.

Πλάτων δὲ καὶ ἐν τοῖς αὐτοῖς πύθαγορίσει. Plut. *Plac.*, ii., 6, 5 & 6; *Opera*, ed. Didot, vol. iv., p. 1081.

⁷⁶ Stob. *Eclog.* ab Heeren, lib. i., p. 10. See also Zeller, *Die Philos. der Griechen*, Erster Theil, p. 376, Leipzig, 1876.

in the latter the icosahedral elements became octahedral. Hence would naturally arise the following geometrical problems :—

Construct an icosahedron which shall be equal to a given cube ;

Construct an octahedron which shall be equal to a given icosahedron.

Now Plutarch, in his *Symp.*, viii., *Quaestio* ii.—Πῶς Πλάτων ἔλεγε τὸν θεὸν ἀεὶ γεωμετερεῖν, 3 & 4⁷⁷—accepts this theory of Pythagoras and Philolaus, and in connection with it points out the importance of the problem : ‘Given two figures, to construct a third which shall be equal to one of the two and similar to the other’—which he praises as elegant, and attributes to Pythagoras (see HERMATHENA, vol. iii. p. 182). It is evident that Plutarch had in view solid and not plane figures ; for, having previously referred to the forms of the constituent elements of bodies, viz., air, earth, fire, and water, as being those of the regular solids, omitting the dodecahedron, he goes on as follows : ‘What,’ said Diogenianus, ‘has this [the problem—given two figures, to describe a third equal to one and similar to the other] to do with the subject?’ ‘You will easily know,’ I said, ‘if you call to mind the division in the Timaeus, which divided into three the things first existing, from which the Universe had its birth ; the first of which three we call *God* [Θεός, the arranger], a name most justly deserved ; the second we call *matter*, and the third *ideal form*. . . . God was minded, then, to leave nothing, so far as it could be accomplished, undefined by limits, if it was capable of being defined by limits ; but [rather] to adorn nature with proportion, measurement, and number : making some one thing [that is, the universe] out of the material taken all together ; something that would be

⁷⁷ Plut. *Opera*, ed. Didot, vol. iv. pp. 876, 7.

like the *ideal form* and as big as the *matter*. So having given himself this problem, when the *two* were there, he made, and makes, and for ever maintains, a *third*, viz., the universe, which is equal to the *matter* and like the *model*.'

Let us now consider one of these problems—the former—and, applying to it the method of reduction, see what is required for its solution. Suppose the problem solved, and that an icosahedron has been constructed which shall be equal to a given cube. Take now another icosahedron, whose edge and volume are supposed to be known, and, pursuing the same method which was followed above in p. 211, we shall find that, in order to solve the problem, it would be necessary—

1. To find the volume of a polyhedron ;
2. To find a line which shall have the same ratio to a given line that the volumes of two given polyhedra have to each other ;
3. To find two mean proportionals between two given lines ; and
4. To construct on a given line as edge a polyhedron which shall be similar to a given one.

Now we shall see that the problem of finding two mean proportionals between two given lines was first solved by Archytas of Tarentum—*ultimus Pythagoreorum*—then by his pupil Eudoxus of Cnidus, and thirdly by Menaechmus, who was a pupil of Eudoxus, and who used for its solution the conic sections which he had discovered : we shall see further that Eudoxus founded stereometry by showing that a triangular pyramid is one-third of a prism on the same base and between the same parallel planes ; lastly, we shall find that these great discoveries were made with the aid of the method of geometrical analysis which either had meanwhile grown out of the method of reduction or was invented by Archytas.

It is probable that a third celebrated problem—the trisection of an angle—also occupied the attention of the geometers of this period. No doubt the Egyptians knew how to divide an angle, or an arc of a circle, into two equal parts; they may therefore have also known how to divide a right angle into three equal parts. We have seen, moreover, that the construction of the regular pentagon was known to Pythagoras, and we infer that he could have divided a right angle into five equal parts. In this way, then, the problem of the trisection of any angle—or the more general one of dividing an angle into any number of equal parts—would naturally arise. Further, if we examine the two reductions of the problem of the trisection of an angle which have been handed down to us from ancient times, we shall see that they are such as might naturally occur to the early geometers, and that they were quite within the reach of a Pythagorean—one who had worthily gone through his noviciate of at least two years of mathematical study and silent meditation. For this reason, and because, moreover, they furnish good examples of the method called ἀπαγωγή, I give them here.

Let us examine what is required for the trisection of an angle according to the method handed down to us by Pappus.⁷⁸

Since we can trisect a right angle, it follows that the trisection of any angle can be effected if we can trisect an acute angle.

Let now $a\beta\gamma$ be the given acute angle which it is required to trisect.

From any point a on the line $a\beta$, which forms one leg of the given angle, let fall a perpendicular $a\gamma$ on the other leg, and complete the rectangle $a\gamma\beta\delta$. Suppose now that the problem is solved, and that a line is drawn making

⁷⁸ Pappi Alex. *Collect.*, ed. Hultsch, vol. i. p. 274.

with $\beta\gamma$ an angle which is the third part of the given angle $\alpha\beta\gamma$; let this line cut $\alpha\gamma$ in ζ , and be produced until it meet $\delta\alpha$ produced at the point ϵ . Let now the straight line $\zeta\epsilon$ be bisected in η , and $\alpha\eta$ be joined; then the lines $\zeta\eta$, $\eta\epsilon$, $\alpha\eta$, and $\beta\alpha$ are all evidently equal to each other, and, therefore, the line $\zeta\epsilon$ is double of the line $\alpha\beta$, which is known.

The problem of the trisection of an angle is thus reduced to another:—

From any vertex β of a rectangle $\beta\delta\alpha\gamma$ draw a line $\beta\zeta\epsilon$, so that the part $\zeta\epsilon$ of it intercepted between the two opposite sides, one of which is produced, shall be equal to a given line.

This reduction of the problem must, I think, be referred to an early period: for Pappus⁷⁹ tells us that when the ancient geometers wished to cut a given rectilineal angle into three equal parts they were at a loss, inasmuch as the problem which they endeavoured to solve as a plane problem could not be solved thus, but belonged to the class called solid;⁸⁰ and, as they were not yet acquainted with the conic sections, they could not see their way: but, later, they trisected an angle by means of the conic sections. He then states the problem concerning a rectangle, to which the trisection of an angle has been just now reduced, and solves it by means of a hyperbola.

The conic sections, we know, were discovered by

⁷⁹ *Ibid.*, vol. i. p. 270, *et seq.*

⁸⁰ The ancients distinguished three kinds of problems—*plane*, *solid*, and *linear*. Those which could be solved by means of straight lines and circles were called plane; and were justly so called, as the lines by which the problems of this kind could be solved have their origin *in plano*. Those problems whose solution is obtained by means of

one or more conic sections were called solid, inasmuch as for their construction we must use the superficies of solid figures—to wit, the sections of a cone. A third kind, called linear, remains, which required for their solution curves of a higher order, such as spirals, quadratrices, conchoids, and cissoids. See Pappi *Collect.*, ed. Hultsch, vol. i. pp. 54 and 270.

Menaechmus, a pupil of Eudoxus (409–356 B.C.), and the discovery may, therefore, be referred to the middle of the fourth century.

Another method of trisecting an angle is preserved in the works of Archimedes, being indicated in Prop. 8 of the *Lemmata*⁸¹—a book which is a translation into Latin from the Arabic. The *Lemmata* are referred to Archimedes by some writers, but they certainly could not have come from him in their present form, as his name is quoted in two of the Propositions. They may have been contained in a note-book compiled from various sources by some later Greek mathematician,⁸² and this Proposition may have been handed down from ancient times.

Prop. 8 of the *Lemmata* is: ‘If a chord AB of a circle be produced until the part produced BC is equal to the radius; if then the point C be joined to the centre of the circle, which is the point D, and if CD, which cuts the circle in F, be produced until it cut it again in E, the arc AE will be three times the arc BF.’ This theorem suggests the following reduction of the problem:—

With the vertex A of the given angle BAC as centre, and any lines AC or AB as radius, let a circle be described. Suppose now that the problem is solved, and that the angle EAC is the third part of the angle BAC; through B let a straight line be drawn parallel to AE, and let it cut the circle again in G and the radius CA produced in F. Then, on account of the parallel lines AE and FGB, the angle ABG or the angle BGA, which is equal to it, will be double of the angle GFA; but the angle BGA is equal to the sum of the angles GFA and GAF; the

⁸¹ Archim. ex recens. Torelli, p. 358.

⁸² See *ibid.*, *Praefatio* J. Torelli, pp. xviii. and xix. See also Heiberg, *Quaest. Archim.*, p. 24, who says:

‘Itaque puto, haec lemmata e plurium mathematicorum operibus esse excerpta, neque definiri jam potest, quantum ex iis Archimedi tribuendum sit.’

angles GFA and GAF are, therefore, equal to each other, and consequently the lines GF and GA are also equal. The problem is, therefore, reduced to the following: From B draw the straight line BGF, so that the part of it, GF, intercepted between the circle and the diameter CAD produced shall be equal to the radius.⁸³

For the reasons stated above, then, I think that the problem of the trisection of an angle was one of those which occupied the attention of the geometers of this period. Montucla, however, and after him many writers on the history of mathematics, attribute to Hippias of Elis, a contemporary of Socrates, the invention of a transcendental curve, known later as the Quadratrix of Dinostratus, by means of which an angle may be divided into any number of equal parts. This statement is made on the authority of the two following passages of Proclus:—

‘Nicomedes trisected every rectilineal angle by means of the conchoidal lines, the inventor of whose particular nature he is, and the origin, construction, and properties of which he has explained. Others have solved the same problem by means of the quadratrices of Hippias and Nicomèdes, making use of the mixed lines which are called quadratrices; others, again, starting from the spirals of Archimedes, divided a rectilineal angle in a given ratio.’⁸⁴

‘In the same manner other mathematicians are accustomed to treat of curved lines, explaining the properties of each form. Thus, Apollonius shows the properties of each of the conic sections; Nicomedes those of the con-

⁸³ See F. Vietæ *Opera Mathematica*, studio F. à Schooten, p. 245, Lugd. Bat. 1646. These two reductions of the trisection of an angle were

given by Montucla, but he did not give any references. See *Hist. des Math.*, tom. i. p. 194, 1^{ière} ed.

⁸⁴ Procl. *Comm.*, ed. Fried., p. 272.

choids; Hippias those of the quadratrix, and Perseus those of the spirals' (σπειρικῶν).⁸⁵

Now the question arises whether the Hippias referred to in these two passages is Hippias of Elis. Montucla believes that there is some ground for this statement, for he says: 'Je ne crois pas que l'antiquité nous fournisse aucun autre géomètre de ce nom, que celui dont je parle.'⁸⁶ Chasles, too, gives only a qualified assent to the statement. Arneth, Bretschneider, and Suter, however, attribute the invention of the quadratrix to Hippias of Elis without any qualification.⁸⁷ Hankel, on the other hand, says that surely the Sophist Hippias of Elis cannot be the one referred to, but does not give any reason for his dissent.⁸⁸ I agree with Hankel for the following reasons:—

1. Hippias of Elis is not one of those to whom the progress of geometry is attributed in the summary of the history of geometry preserved by Proclus, although he is mentioned in it as an authority for the statement concerning Ameristus [or Mamercus].⁸⁹ The omission of his name would be strange if he were the inventor of the quadratrix.

2. Diogenes Laertius tells us that Archytas was the first to apply an organic motion to a geometrical diagram;⁹⁰ and the description of the quadratrix requires such a motion.

⁸⁵ Procl. *Comm.*, ed. Fried., p. 356.

⁸⁶ Montucl., *Hist. des Math.*, tom. i. p. 181, nouvelle ed.

⁸⁷ Chasles, *Histoire de la Géom.*, p. 8; Arneth, *Gesch. der Math.*, p. 95; Bretsch., *Geom. vor Eukl.*, p. 94; Suter, *Gesch. der Math. Wissenschaft.*, p. 32.

⁸⁸ Hankel, *Gesch. der Math.*, p. 151, note. Hankel, also, in a review of Suter, *Geschichte der Mathematischen Wissenschaften*, published in the *Bullettino*

di Bibliografia e di Storia delle Scienze Matematiche e Fisiche, says: 'A pag. 31 (lin. 3-6), Hippias, l'inventore della quadratrice, è identificato col Sofista Hippias, il che veramente avea già fatto il Bretschneider (pag. 94, lin. 39-42), ma senza darne la minima prova.' *Bullet.*, &c., tom. v. p. 297.

⁸⁹ Procl. *Comm.*, ed. Fried., p. 65.

⁹⁰ Diog. Laert., viii. c. 4, ed. Cobet, p. 224.

3. Pappus tells us that: 'For the quadrature of a circle a certain line was assumed by Dinostratus, Nicomedes, and some other more recent geometers, which received its name from this property: it is called by them the quadratrix.'¹

4. With respect to the observation of Montucla, I may mention that there was a skilful mechanic and geometer named Hippias contemporary with Lucian, who describes a bath constructed by him.²

I agree, then, with Hankel that the invention of the quadratrix is erroneously attributed to Hippias of Elis. But Hankel himself, on the other hand, is guilty of a still greater anachronism in referring back the Method of Exhaustions to Hippocrates of Chios. He does so on grounds which in my judgment are quite insufficient.

¹ Pappi, *Collect.*, ed. Hultsch, vol. i. pp. 250 and 252.

² *Hippias, seu Balneum*. Since the above was written I find that Cantor, *Vorles. über Gesch. der Math.*, p. 165, *et seq.*, agrees with Montucla in this. He says: 'It has indeed been sometimes doubted whether the Hippias referred to by Proclus is really Hippias of Elis, but certainly without good grounds.' In support of his view Cantor advances the following reasons:—

1. Proclus in his commentary follows a custom from which he never deviates—he introduces an author whom he quotes with distinct names and surnames, but afterwards omits the latter when it can be done without an injury to distinctness. Cantor gives instances of this practice, and adds: 'If, then, Proclus mentions a Hippias, it must be Hippias of Elis, who had been already once distinctly so named in his Commentary.'

2. Waiving, however, this custom of Proclus, it is plain that with any author, especially with one who had devoted such earnest study to the works of Plato, Hippias without any further name could be only Hippias of Elis.

3. Cantor, having quoted passages from the dialogues of Plato, says: 'We think we may assume that Hippias of Elis must have enjoyed reputation as a teacher of mathematics at least equal to that which he had as a Sophist proper, and that he possessed all the knowledge of his time in natural sciences, astronomy, and mathematics.'

4. Lastly, Cantor tries to reconcile the passage quoted from Pappus with the two passages from Proclus: 'Hippias of Elis discovered about 420 B.C. a curve which could serve a double purpose—trisecting an angle and squaring the circle. From the latter application it got its name, *Quadratrix* (the Latin translation), but this name does not seem to reach further back than Dinostratus.

Hankel, after quoting from Archimedes the axiom—‘If two spaces are unequal, it is possible to add their difference to itself so often that every finite space can be surpassed,’ *see* p. 185—quotes further: ‘Also, former geometers have made use of this lemma; for the theorem that circles are in the ratio of the squares of their diameters, &c., has been proved by the help of it. But each of the theorems mentioned is by no means less entitled to be accepted than those which have been proved without the help of that lemma; and, therefore, that which I now publish must likewise be accepted.’ Hankel then reasons thus: ‘Since, then, Archimedes brings this lemma into such connection with the theorem concerning the ratio of the areas of circles, and, on the other hand, Eudemus states that this theorem had been discovered and proved by Hippocrates, we may also assume that Hippocrates laid down the above axiom, which was taken up again by Archimedes, and which, in one shape or another, forms the basis of the Method of Exhaustions of the Ancients, *i.e.* of the method to exhaust, by means of inscribed and circumscribed polygons, the surface of a curvilinear figure. For this method necessarily requires such a principle in order to show that the curvilinear figure is really exhausted by these polygons.’⁹³ Eudemus, no doubt, stated that Hippocrates showed that circles have the same ratio as the squares on their diameters, but he does not give any indication as to the way in which the theorem was proved. An examination, however, of the portion of the passage quoted from Archimedes which is omitted by Hankel will, I think, show that there is no ground for his assumption.

The passage, which occurs in the letter of Archimedes to Dositheus prefixed to his treatise on the quadrature of

⁹³ Hankel, *Gesch. der Math.*, pp. 121-2.

the parabola, runs thus: 'Former geometers have also used this axiom. For, by making use of it, they proved that circles have to each other the duplicate ratio of their diameters; and that spheres have to each other the triplicate ratio of their diameters; moreover, that any pyramid is the third part of a prism which has the same base and the same altitude as the prism; also, that any cone is the third part of a cylinder which has the same base and the same altitude as the cone: all these they proved by assuming the axiom which has been set forth.'⁹⁴

We see now that Archimedes does not bring this axiom into close connection with the theorem concerning the ratios of the areas of circles alone, but with three other theorems also; and we know that Archimedes, in a subsequent letter to the same Dositheus, which accompanied his treatise on the sphere and cylinder, states the two latter theorems, and says expressly that they were discovered by Eudoxus.⁹⁵ We know, too, that the doctrine of proportion, as contained in the Fifth Book of Euclid, is attributed to Eudoxus.⁹⁶ Further, we shall find that the invention of rigorous proofs for theorems such as Euclid, vi. 1, involves, in the case of incommensurable quantities, the same difficulty which is met with in proving rigorously the four theorems stated by Archimedes in connection with this axiom; and that in fact they all required a new method of reasoning—the Method of Exhaustions—which must, therefore, be attributed to Eudoxus.

The discovery of Hippocrates, which forms the basis of his investigation concerning the quadrature of the circle, has attracted much attention, and it may be interesting to

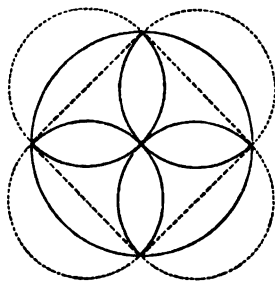
⁹⁴ Archim. ex recens. Torelli, p. 18.

⁹⁵ *Ibid.*, p. 64.

⁹⁶ We are told so in the anonymous scholium on the Elements of Euclid, which Knoche attributes to Proclus:

see Eucl. *Elem.*, Græce ed. ab. August, pars ii., p. 329; also *Untersuchungen*, &c., Von Dr. J. H. Knoche, p. 10. Cf. HERMATHENA, vol. iii. p. 204, and note 105.

inquire how it might probably have been arrived at. It appears to me that it might have been suggested in the following way:—Hippocrates might have met with the annexed figure, excluding the dotted lines, in the arts of decoration; and, contemplating the figure, he might have completed the four smaller circles and drawn their diameters, thus forming a square inscribed in the larger circle, as in the diagram. A diameter of the larger circle being then a diagonal of the square, whose sides are the diameters of the smaller circles, it follows that the larger circle is equal to the sum of two of the smaller circles. The larger circle is, therefore, equal to the sum of the four semicircles included by the dotted lines. Taking away the common parts—sc. the four segments of the larger circle standing on the sides of the square—we see that the square is equal to the sum of the four lunes.



This observation—concerning, as it does, the geometry of areas—might even have been made by the Egyptians, who knew the geometrical facts on which it is founded, and who were celebrated for their skill in geometrical constructions. See *HERMATHENA*, vol. iii. pp. 186, 203, note 101.

In the investigation of Hippocrates given above we meet with manifest traces of an analytical method, as stated in *HERMATHENA*, vol. iii. p. 197, note 91. Indeed, Aristotle—and this is remarkable—after having defined ἀναγωγή, evi-

dently refers to a part of this investigation as an instance of it: for he says, 'Or again [there is reduction], if the middle terms between γ and β are few; for thus also there is a nearer approach to knowledge. For example, if δ were quadrature, and ϵ a rectilineal figure, and ζ a circle; if there were only one middle term between ϵ and ζ , viz., that a circle with lunes is equal to a rectilineal figure, there would be an approach to knowledge.' See p. 195, above.

In many instances I have had occasion to refer to the method of reduction as one by which the ancient geometers made their discoveries, but perhaps I should notice that in general it was used along with geometrical constructions:⁹⁸ the importance attached to these may be seen from the passages quoted above from Proclus and Democritus, pp. 178, 207; as also from the fact that the Greeks had a special name, *ψευδογράφημα*, for a faulty construction.

The principal figure, then, amongst the geometers of this period is Hippocrates of Chios, who seems to have attracted notice as well by the strangeness of his career as by his striking discovery of the quadrature of the lune. Though his contributions to geometry, which have been set forth at length above, are in many respects important, yet the judgment pronounced on him by the ancients is certainly, on the whole, not a favourable one—witness the statements of Aristotle, Eudemus, Iamblichus, and Eutocius.

How is this to be explained? The faulty reasoning

⁹⁷ ἢ πάλιν [ἀπαγωγή ἐστι] εἰ ὀλίγα τὰ μέσα τῶν βγ· καὶ γὰρ οὕτως ἐγγύτερον τοῦ εἰδέναι. οἷον εἰ τὸ δ εἴη τετραγωνίσεσθαι, τὸ δ' ἐφ' ᾧ ε εὐθύγραμμον, τὸ δ' ἐφ' ᾧ ζ κύκλος· εἰ τοῦ ες ἂν μόνον εἴη μέσον, τὸ μετὰ μηνίσκων ἴσον γίνεσθαι εὐθυγράμμῳ τὸν κύκλον, ἐγγὺς ἂν εἴη τοῦ εἰδέναι. *Anal. Prior.* ii. 25, p. 69, a,

ed. Bek. Observe the expressions τὸ δ' ἐφ' ᾧ ε εὐθύγραμμον, &c., here, and see p. 199, note 44.

⁹⁸ Concerning the importance of geometrical constructions as a process of deduction, see P. Laffitte, *Les Grands Types de l'Humanité*, vol. ii. p. 329.

into which he is reported to have fallen in his pretended quadrature of the circle does not by itself seem to me to be a sufficient explanation of it: and indeed it is difficult to reconcile such a gross mistake with the sagacity shown in his other discoveries, as Montucla has remarked.⁹⁹

The account of the matter seems to me to be simply this:—Hippocrates, after having been engaged in commerce, went to Athens and frequented the schools of the philosophers—evidently Pythagorean—as related above. Now we must bear in mind that the early Pythagoreans did not commit any of their doctrines to writing¹⁰⁰—their teaching being oral: and we must remember, further, that their pupils (ἀκουστικοί) were taught mathematics for several years, during which time a constant and intense application to the investigation of difficult questions was enjoined on them, as also silence—the rule being so stringent that they were not even permitted to ask questions concerning the difficulties which they met with:¹⁰¹ and that after they had satisfied these conditions they passed into the class of mathematicians (μαθηματικοί), being freed from the obligation of silence; and it is probable that they then taught in their turn.

Taking all these circumstances into consideration, we may, I think, fairly assume that Hippocrates imperfectly understood some of the matter to which he had listened; and that, later, when he published what he had learned, he did not faithfully render what had been communicated to him.

If we adopt this view, we shall have the explanation of—

1. The intimate connection that exists between the work of Hippocrates and that of the Pythagoreans;

⁹⁹ Montucla, *Histoire des recherches sur la Quadrature du Cercle*, p. 39, nouv. ed., Paris, 1831.

¹⁰⁰ See HERMATHENA, vol. iii. p. 179, note, and the references given

there.

¹⁰¹ See A. Ed. Chaignet, *Pythagore et la Philosophie Pythagoricienne*, vol. i. p. 115, Paris, 1874; see also Iambl., *de Vit. Pyth.*, c. 16, s. 68.

2. The paralogism into which he fell in his attempt to square the circle: for the quadrature of the lune on the side of the inscribed square may have been exhibited in the school, and then it may have been shown that the problem of the quadrature of the circle was reducible to that of the lune on the side of the inscribed hexagon; and what was stated conditionally may have been taken up by Hippocrates as unconditional;¹⁰²

3. The further attempt which Hippocrates made to solve the problem by squaring a lune and circle together (see p. 201);

4. The obscurity and deficiency in the construction given in p. 199; and the dependence of that construction on a problem which we know was Pythagorean (see HERMATHENA, vol. iii. p. 181 (e), and note 61);¹⁰³

5. The passage in Iamblichus, see p. 186 (f); and, generally, the unfavourable opinion entertained by the ancients of Hippocrates.

This conjecture gains additional strength from the fact that the publication of the Pythagorean doctrines was first

¹⁰² In reference to this paralogism of Hippocrates, Bretschneider (*Geom. vor Eukl.*, p. 122) says, 'It is difficult to assume so gross a mistake on the part of such a good geometer,' and he ascribes the supposed error to a complete misunderstanding. He then gives an explanation similar to that given above, with this difference, that he supposes Hippocrates to have stated the matter correctly, and that Aristotle took it up erroneously; it seems to me more probable that Hippocrates took up wrongly what he had heard at lecture than that Aristotle did so on reading the work of Hippocrates. Further, we see from the quotation in p. 225, from *Anal. Prior.*, that Aristotle fully understood the condi-

tions of the question.

¹⁰³ Referring to the application of areas, Mr. Charles Taylor, *An Introduction to the Ancient and Modern Geometry of Conics*, Prolegomena, p. xxv., says, 'Although it has not been made out wherein consisted the importance of the discovery in the hands of the Pythagoreans, we shall see that it played a great part in the system of Apollonius, and that he was led to designate the three conic sections by the Pythagorean terms Parabola, Hyperbola, Ellipse.'

I may notice that we have an instance of these problems in the construction referred to above: for other applications of the method see HERMATHENA, vol. iii. pp. 196 and 199.

made by Philolaus, who was a contemporary of Socrates, and, therefore, somewhat junior to Hippocrates: Philolaus may have thought that it was full time to make this publication, notwithstanding the Pythagorean precept to the contrary.

The view which I have taken of the form of the demonstrations in geometry at this period differs altogether from that put forward by Bretschneider and Hankel, and agrees better not only with what Simplicius tells us 'of the summary manner of Eudemus, who, according to archaic custom, gives concise proofs' (see p. 196), but also with what we know of the origin, development, and transmission of geometry: as to the last, what room would there be for the silent meditation on difficult questions which was enjoined on the pupils in the Pythagorean schools, if the steps were minute and if laboured proofs were given of the simplest theorems?

The need of a change in the method of proof was brought about at this very time, and was in great measure due to the action of the Sophists, who questioned everything.

Flaws, no doubt, were found in many demonstrations which had hitherto passed current; new conceptions arose, while others, which had been secret, became generally known, and gave rise to unexpected difficulties; new problems, whose solution could not be effected by the old methods, came to the front, and attracted general attention. It became necessary then on the one hand to recast the old methods, and on the other to invent new methods, which would enable geometers to solve the new problems.

I have already indicated the men who were able for this task, and I propose in the continuation of this Paper to examine their work.

GEORGE J. ALLMAN.

TO FIND THE VELOCITY-POTENTIAL FOR
LIQUID CONTAINED BETWEEN A FIXED
ELLIPSOID AND A MOVING CONFOCAL
ELLIPSOID WITHIN THE FORMER.

LET the potential of the smaller ellipsoid, considered as a mass of uniform unit density, be V , at a point outside itself (which point may be either inside or outside the larger ellipsoid); and let V' be the potential of the larger ellipsoid, considered as a mass of uniform unit density, so that within the larger ellipsoid we may put

$$V' = \frac{A'x^2 + B'y^2 + C'z^2}{2} + V'_0.$$

The inner ellipsoid is supposed to be moving with velocity U along the direction $(\alpha'\beta'\gamma')$, and with angular velocity Ω about the direction $(\alpha\beta\gamma)$; the axes of co-ordinates being right-hand and along the axes of the ellipsoids.

First, the velocity-potential ϕ may be assumed to be

$$\begin{aligned} \phi = & L \frac{dV}{dx} + M \frac{dV}{dy} + N \frac{dV}{dz} + L' \frac{dV}{d\theta_1} + M' \frac{dV}{d\theta_2} + N' \frac{dV}{d\theta_3} \\ & + \lambda \frac{dV'}{dx} + \mu \frac{dV'}{dy} + \nu \frac{dV'}{dz} + \lambda' \frac{dV'}{d\theta_1} + \mu' \frac{dV'}{d\theta_2} + \nu' \frac{dV'}{d\theta_3}, \end{aligned} \quad (1)$$

where $\theta_1, \theta_2, \theta_3$ are angular displacements round the axes; and it will then remain to determine the constants $L, M, \dots \lambda, \mu, \dots$

First, ϕ satisfies the equation of continuity $\frac{d^2\phi}{dx^2} + \frac{d^2\phi}{dy^2} + \frac{d^2\phi}{dz^2} = 0$ ($\nabla^2\phi = 0$) throughout the liquid, for $\nabla^2V = 0$;

therefore $\frac{d}{dx}(\nabla^2 V)$ or $\nabla^2\left(\frac{dV}{dx}\right) = 0$, and similarly for the other terms of the first row in ϕ . Again, $\nabla^2 V' = A' + B' + C'$ a constant; therefore $\nabla^2\left(\frac{dV'}{dx}\right) = 0$ inside the larger ellipsoid, and so for the remaining terms in ϕ .

To determine the constants the surface conditions are to be used.

Since $\frac{dV}{d\theta_1} = y \frac{dV}{dz} - z \frac{dV}{dy}$, &c., and $\frac{dV'}{dx} = A'x$, &c., equation (1) becomes

$$\begin{aligned} \phi = & \frac{dV}{dx} [L - N'y + M'z] + \frac{dV}{dy} [M - L'z + N'x] \\ & + \frac{dV}{dz} [N - M'x + L'y] + A'x [\lambda - v'y + \mu'z] \\ & + B'y [\mu - \lambda'z + v'x] + C'z [v - \mu'x + \lambda'y]. \end{aligned} \quad (2)$$

At the surface of the larger ellipsoid the normal velocity of the liquid is to be zero, *i.e.* the value at the surface of $\frac{d\phi}{dn'_i} = 0$, where n'_i denotes the length of the normal drawn to the larger ellipsoid from a point inside it. Hence, using (2), and noting that $\frac{dx}{dn'_i} = -l'$, with similar values for the other direction-cosines of the normal, the surface condition gives

$$\left. \begin{aligned} & \frac{dV}{dx} [N'm' - M'n'] + \frac{d^2V}{dn'_i dx} [L - N'y + M'z] \\ & \quad + \dots + \dots + \dots + \dots \\ & + A'x [v'm' - \mu'n'] - A'l' [\lambda - v'y + \mu'z] \\ & \quad + \dots - \dots + \dots - \dots \end{aligned} \right\} = 0.$$

Now at, and outside, the larger ellipsoid (see Thomson and Tait's *Natural Phil.*, vol. i., Art. 523), $\frac{dV}{dx} : \frac{dV'}{dx} ::$ mass of smaller ellipsoid : mass of larger :: $r : 1$ say ; and, n_o' being the outward normal, $\frac{d^2 V}{dn_o' dx} = -\frac{d^2 V'}{dn_o' dx}$, which, since the variation is outside the larger ellipsoid, becomes $-\tau \frac{d^2 V'}{dn_o' dx}$. But $\frac{dV'}{dx}$ is (Maxwell's *Electricity*, Art. 437) the potential due to a surface-density $-l'$; hence

$$\frac{d^2 V'}{dn_o' dx} + \frac{d^2 V'}{dn_i' dx} = 4\pi l' ;$$

therefore

$$\frac{d^2 V}{dn_i' dx} = -\tau(4\pi + A')l'.$$

Using the above, and remembering that $l' = \frac{\phi' x}{a'^3}$, &c., the surface condition becomes

$$\left. \begin{aligned} & \tau A' x \left[N' \frac{y}{y'^2} - M' \frac{z}{z'^2} \right] - \tau(4\pi + A') \left[L - N'y + M'z \right] \frac{x}{a'^3} \\ & \quad + \dots - \dots + \dots - \dots \\ & + A' x \left[v' \frac{y}{y'^2} - \mu' \frac{z}{z'^2} \right] - A' \left[\lambda - v'y + \mu'z \right] \frac{x}{a'^3} \\ & \quad + \dots - \dots + \dots - \dots \end{aligned} \right\} = 0.$$

Equating the coefficients of the different terms in x, y , &c., to zero, this gives

$$\tau(4\pi + A')L + A'\lambda = 0,$$

and

$$\begin{aligned} \tau L' \left[(B' - C') \left(\frac{1}{y'^2} + \frac{1}{z'^2} \right) + 4\pi \left(\frac{1}{y'^2} - \frac{1}{z'^2} \right) \right] \\ + \lambda' (B' - C') \left(\frac{1}{y'^2} + \frac{1}{z'^2} \right) = 0, \end{aligned}$$

with two pairs of similar equations.

In a similar manner the surface condition at the smaller ellipsoid gives the equations

$$(4\pi + A)L + A'\lambda = Ua',$$

and

$$L' \left[(B - C) \left(\frac{1}{b^2} + \frac{1}{c^2} \right) + 4\pi \left(\frac{1}{b^2} - \frac{1}{c^2} \right) \right] \\ + \lambda' (B' - C') \left(\frac{1}{b^2} + \frac{1}{c^2} \right) = \Omega a \left(\frac{1}{b^2} - \frac{1}{c^2} \right),$$

with two pairs of similar equations.

Thus the twelve constants can be determined by the twelve equations.

The undotted letters denote the constants for the smaller ellipsoid corresponding to the constants for the larger ellipsoid, which are denoted by dotted letters.

J. F. ADAIR.

ON A LIMIT TO THE NUMBER OF CUSPS BELONGING TO A PLANE CURVE OF ANY ORDER.

DR. SALMON has proved that a plane curve of the order n cannot have more than $\frac{1}{2}(n-1)(n-2)$ double points (*Higher Plane Curves*, p. 29); he has not, however, determined a similar limit for cusps which, in the case of curves of a higher order than the fourth, is considerably less than the corresponding number for ordinary nodes.

I propose in the present short Paper to attempt to determine such a limit.

The theory of the Hessian supplies a ready method of doing so; for, since the Hessian is of the order $3(n-2)$, it cannot intersect the original curve in more than $3n(n-2)$ points; now, since each double point counts for 6 such intersections, and each cusp for 8, we must always have

$$3n(n-2) (> \text{ or } =) 6\delta + 8k$$

(using Dr. Salmon's notation), for otherwise we should have two curves intersecting in a greater number of points than the product of the degrees of their respective equations, which is impossible. Hence, to determine the maximum number of cusps when there are no other double points, put $\delta = 0$, and we find the relation

$$k (< \text{ or } =) \frac{3n(n-2)}{8}.$$

If n be even, $\frac{n(n-2)}{8}$ is an integer, but not if n be odd; hence we have the following theorems:—

1. No curve of an even degree (n) can have more than $\frac{3n(n-2)}{8}$ cusps.

2. No curve of an odd degree (n) can have more cusps than the integer next lower to $\frac{3n(n-2)}{8}$.

Thus a curve of the fifth order cannot have more than 5 cusps, though it may have 6 ordinary nodes; or a curve of the 8th order cannot have more than 18 cusps, though it may have 21 ordinary double points.

In every curve (of a higher order than the fourth) this limit is less than the limit for ordinary double points, for

$$\frac{1}{2}(n-1)(n-2) - \frac{3n \cdot n - 2}{8} = \frac{n-2}{8}(n-4),$$

which for values of n higher than 4 is always positive.

If a curve has the maximum number of cusps determined as above, it can have no other double points. This is obvious in the case of curves of an even order, for in this case we have

$$3n(n-2) = 8k;$$

∴ the relation

$$3n \cdot n - 2 \cdot (> \text{ or } =) 6\delta + 8k, \quad (\text{A})$$

which gives at once $\delta = 0$.

In the case of n being odd, we have

$$3n(n-2) = 8k + R, \quad (\text{B})$$

where k is an integer and R an integer less than 8; hence from (A) we have

$$R (> \text{ or } =) 6\delta;$$

hence, if δ be not equal to 0, R must = 7 or 6. Putting these values in relation (B), we should have for $R = 7$ (if we substitute $2m + 1$ for n)—

$$12m^2 - 10 = 8k, \quad \text{or} \quad 6m^2 - 5 = 4k,$$

which is impossible, since $6m^2 - 5$ must be odd. By substituting $R = 6$ we get $12m^2 - 9 = 8k$, which is equally impossible; therefore, in this case also δ must equal 0, or the curve can have no other double point: *e.g.* a sextic curve with 9 cusps has no other double point; or a curve of the order seven, with 13 cusps, can have no other double point, though it might have 15 ordinary nodes.

It thus appears that no plane curve, of a higher order than the fourth, and with its maximum number of cusps, can be unicursal. If the curve be unicursal, we have

$$\delta + k = \frac{1}{2}(n-1)(n-2);$$

and the relation

$$3n(n-2) - 6\delta - 8k (> \text{ or } =) 0$$

gives at once

$$k (< \text{ or } =) \frac{3(n-2)}{2}.$$

Hence we have

1. No unicursal curve of an even degree n can have more than $\frac{3(n-2)}{2}$ cusps.

2. No unicursal curve of an odd degree n can have more cusps than the integer next lower to $\frac{3(n-2)}{2}$.

For example, of the 10 nodes of a unicursal sextic, 6 at most can be cusps; or, of the 15 nodes of a unicursal curve of the seventh order no more than 7 can be cusps.

JOHN C. MALET.

QUEEN'S COLLEGE, CORK.

**‘MATHEMATICAL PRINCIPLES OF TIDAL
THEORY AND OBSERVATION’:**

A LETTER to the Editor of ‘HERMATHENA.’

SIR,

I regret that I am obliged to trouble you with a question of priority.

The last number of HERMATHENA contains a Paper by my friend Dr. Haughton on the ‘Mathematical Principles of Tidal Theory and Observation.’ Prop. XIII. (pp. 588 *et seq.*) is as follows:—

It is required to find the complete differential equations of motion of an ocean surrounding a solid nucleus, and subject to any disturbing forces (the nucleus itself revolving on a fixed axis); without calculation or transformation of co-ordinates; from simple geometrical and mechanical principles.

Dr. Haughton’s investigation of this problem is similar to that given by me in a Paper entitled ‘Method of deducing the Polar Equations of Dynamics and Hyrodynamics from direct Physical considerations.’

This Paper was laid before the Mathematical Committee of the Dublin University Philosophical Society in January, 1847, and a *Report* on it by that Committee was

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published in vol. iii. of the *Transactions* of the Society for the 4th and 5th Sessions, ending November, 1847.

I am authorized by Dr. Haughton to state, that until I called his attention to it he had not remembered my Paper.

I am, Sir,

Your obedient servant,

GEORGE J. ALLMAN.

QUEEN'S COLLEGE, GALWAY.

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HERMATHENA.

EMENDATIONS.

LUCILIUS, 29 (Lachmann).

ERRATA.

Page 263, line 24, *dele* "with."

„ 335, line 3, *for* *δλην* *read* *δλον*.

PLAUTUS, *Amphitruo*, Arg. i. 9.

Omnem rem noscunt : geminos Alcumena enititur.

The line is a foot too long. Bothe and Fleckeisen give *illa* for *Alcumena*. Ussing would omit *geminos*. Rather omit *omnem* :

Rem noscunt : geminos Alcumena enititur.

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Amphitruo, Prol. 32.

Propterea pace advenio, et pacem ad vos adfero.

Read, striking out *pacem*:

Propterea pace advenio et ad vos ME adfero.

Cf. iii. 4. 6:

Ego sum Ioui dicto audiens, eius iussu nunc huc me adfero.

Cf. Verg., *Aen.* iii. 310; iii. 346, &c. *Adferor*, without *me*, would be nearer the MSS; but the usage is not so common.

Amphitruo, Prol. 81.

Hoc quoque etiam mihi in mandatis dedit.

Read:

Hoc quoque etiam mihi in mandatis IS dedit.

Amphitruo, Prol. 141.

Et seruos, quouis ego hanc fero imaginem.

A hiatus, 'vix credibilis,' as Ussing remarks, variously corrected. Read:

Et seruos, quouis ego hanc fero IN ME imaginem.

Cf. 265:

Quando imagost huius *in me* certumst hominem eludere.
Et enimvero, quoniam formam huius cepi *in me* et statum
Decet et facta moresque huius habere *me* similes item.

Cf. *New Testament*, Phil. i. 7 (A. V.): 'But took upon him the form of a servant.'

Amphitruo, 220.

Deinde utrique imperatores in medium exeunt.

This and the two next emendations are in cretic tetrameters. Read:

Deinde utrimque imperatores mediri exeunt.

Amphitruo, 227, 228.

Imperator uterque hinc et illinc Iovi
Vota suscipere hortari exercitum.

The double hiatus in the second line proves its corruption. Read:

Vota suscipere, PRO RE hortari exercitum.

The leaders spoke briefly, as well as time and place allowed, encouraging their army. *Pro re* easily fell out after *-pere*: cf. Verg., *Aen.* iv. 337, 'Pro re pauca loquar'; Sall., *Jug.* 54, 'Deinde ipse pro re atque loco—paulatim procedere.

Amphitruo, 229–231.

Pro se quisque id quod quisque potis est et valet
Edit, ferro ferit: tela frangunt; boat
Caelum fremitu virum; ex spiritu atque anhelitu
Nebula constat; cadunt volnerum vi viri.

In the third line Ussing considers the first syllable of *atque* to be short. This is a doubtful point. It is easy enough to restore the metre here by reading HALITU, without resorting to this expedient.

Amphitruo, 263.

Et enim vero quoniam formam huius cepi in me et statum,
Decet et facta moresque huius habere me similes item.

Cepi rather demands CAPERE than *habere*: and by reading the former word diæresis is restored.

Amphitruo, 542-546.

Nunc te, nox, quae me mansisti mitto ut concedas die
Ut mortalis inlucescas luce clara et candida.
Atque quanto nox fuisti longior hac proxuma
Tanto brevior dies ut fiat faciam ut aequè disparet
Et dies e nocte accedat. Ibo et Mercurium subsequar.

There is only one way, I am pretty sure, in which sense can be restored to the last three lines. It is by writing them thus:

Atque quanto, nox, fuisti longior, HAEC proxima
Tanto brevior NOX ut fiat faciam, ut aequè disparem
Et DIE e nocte accedat. Ibo et Mercurium subsequar.

One night has been lengthened beyond its due limits. Jupiter says to make up for that he will make the next night shorter, in order to equalise matters. It would be a strange method of equalising to make the day shorter. *Dies* was substituted for *nox* by those who did not see that *haec proxuma* was the true reading, and who therefore did not understand what *nox* could be referred to. *Disparare* is a Plautine verb, *Rud. Prol.* 10. *Die* in the last line is dat. as in the first line.

Translate: 'And, O night, by how much thou hast been longer (than usual), so much shorter shall I make this coming night, that I may make an equal division, and that there may be an addition to the day from the night.'

Amphitruo, 829-31.

AM. Mulier es audacter iuras. ALC. Quae non deliquit decet
Audacem esse confidenter pro se et proterue loqui.

AM. Satis audacter. ALC. Ut pudicam decet. AM. †In verbis
probas.

For the corruption I propose :

I, verbis inproba 's,

‘Away! you are a bold baggage with your tongue!’

Cf. Shaks., *Much Ado*, 5. 2. 73: ‘Away! you are an ass,
you are an ass!’

Amphitruo, 944, 5.

Blepharonem arcessat qui nobiscum prandeat.

Is adeo inpransus IPSUS ludificabitur.

There is a gap in the MSS. where I have written *ipsus*, which easily fell out after *inpransus*, and which is exactly the word wanted. *Amphitruo* and *Sosia* have already been befooled: now even *Blepharo*, who is to be called in as umpire, is to be mystified in his turn. *Ludis*, *lepide*, and other words have been suggested, all good in themselves, but which allow no point to *adeo*, which indicates a farther instance of fooling.

Amphitruo, 1031.

This line, not in our MSS., is given by Ussing here from Nonius, p. 543, who thus writes: *Matella*, aquarium vas, *Plautus in Amphitryone*:

Ne tu postules matula unam tibi aquam infundi in caput.

These words evidently belong to *Mercury*, who is on the

roof of Amphitruo's house for the purpose of driving Amphitruo away. Read :

Ne tu postules matulam, URNAM tibi aquae defudi in caput.

Mercury empties an *urna* of water on Amphitruo's head, with the taunt : 'For fear you should ask for a carafe of water, there's a whole jugful for you.' The *urna* I should say, from this passage, was larger than the *matula*.

Amphitruo, 1037, 1038.

These lines are given by Nonius, p. 44, thus :

Quasi aduenienti morbo medicati iuuem tu certe laruatus es aut cerritus.

Hence I would read, giving *Quaese* which Ussing reads from Acidalius, thus :

BLEPH. Quaese aduenienti morbo medicum. AM. At tu suem :
Tu certe aut laruatus aut cerritus es.

Blepharo says, 'go and look for a doctor for your coming malady of madness.' Amphitruo retorts, 'go you and look for a hog to sacrifice to cure your insanity.' See my note on *Menaechmi*, 881, in HERMATHENA, No. VII. p. 142 *seqq.*

Amphitruo, 1040.

Nonius, p. 76, Plautus, *Amphitryone*: Nec nobis praesente aliquis quisquam nisi servus. This is evidently a trochaic tetrameter mutilated. Read :

Nec nobis praesente, TE alius quisquam nisi seruus meus

Some verb governing *te* probably occurred in the next line.

Amphitruo, 1071.

Ita mihi videntur omnia, mare, terra caelum †consequi
Iam ut opprimar, ut enicer. Me miseram, quid agam nescio.

Bromia, terrified by the thunder and lightning at the birth of Hercules, utters these words. Ussing rather cleverly reads *concoqui* for *consequi*, saying that some word is wanted denoting the *confounding* of earth, sea, and sky. But this by no means suits *ut opprimar, ut enicer*: rather some word denoting that earth, sea, and sky *were in a conspiracy* to cause her destruction is wanted. This idea might be expressed by CONLOQUI.

Asinaria, 98.

Iubeas una opera me piscari in aere,
Venari autem rete iaculo in medio mari.

A *rete iaculum*, or casting net, is exactly the thing to fish in the deep sea with, and therefore the intended absurdity of the proposition is greatly weakened. Transpose :

Iubeas una opera me piscari in aere
Rete iaculo : venari autem in medio mari.

‘You might as well bid me fish in the sky with a drag-net : and go a-hunting on the high sea.’

Asinaria, 306.

LI. Quid istud negotii est certum est credere audacter licet.

Read :

LI. Quid istuc tibi negotist ? LE. Tutumst credere ? LI. Audacter licet.

Certumst credere, the ordinary reading, cannot mean, as Ussing has pointed out, 'is it safe to trust you?' *Certum est* means 'I am resolved.' Hence Ussing proposes *exortumst*, joining it to what precedes, and giving the whole line to Libanus. But I think it better to read *tutumst* : *tu* fell out, and *-tumst* was badly corrected to *certumst*.

Asinaria, 329.

Mitto : istuc quod adfers aures expectant meae,

Obviously :

Mitto : istuc, ISTUC quod adfers aures expectant meae.

Asinaria, 369.

Mox quom Sauream imitabor caveto ne succenseas.

The editors get over the metrical difficulty by transposing *imitabor* and *Sauream*. But the true reading is :

Mox quum Sauream *ego* imitabor CAVE TU ne succenseas.

Asinaria, 430.

LE. Eho †ecquis pro vectura olivi

†Resolvit ? LI. Solvit. LE. Quoi datumst ? LI. Sticho vicario ipsi Tuo.

I do not pretend to be able to restore the proper name hidden in *ecquis*. But for *Resolvit*, where Ussing reads *Rem solvit* with Bothe, we should read *AES solvit*. A neuter is wanted, as is shown by *datumst*.

Asinaria, 495.

LE. Frugi tamen sum nec potest peculium enumerari.

MERC. Fortasse. LE. Etiam ꝑnunc dico Periphanes Rhodo mercator dives

Absente ero solus mihi talentum argenti soli

Numeravit et mihi credidit nequest deceptus in eo.

For the corrupt *nunc dico* Ussing gives *hodie*. Bothe and Fleckeisen leave out *dico*. Read :

LE. Etiam ANNO Periphanes Rhodo mercator dives *et*.

Anno, 'last year': cf. *Amph.* 91.

Asinaria, 609.

LE. O Libane ut miser est homo qui amat. LI. Immo hercle vero Qui pendet multo miserior. LE. Scio qui periculum feci.

To avoid the very unlikely hiatus after *Libane*, read :

O Libane, NE miser est homo qui amat.

Ne, 'verily,' is just the word wanted, and this is another illustration of the ordinary source of corruption.

Asinaria, 704.

Quid nunc quoniam amabo ut est lubitum nos delusistis.

The metre is Iambic septenarian, and two syllables are wanting :

Quid nunc quoniam ambo ut est lubitum nos delusistis ISTIS.

Ambo is an old correction for *amabo* ; *animo* is also possible. The addition of *istis* after *delusistis* is simple : 'Since you have both made game of us in the way you have,' 'with those tricks.'

Pseudulus, 792.

Nam ego si iuratus peiorem hominem quaererem
 Peiorem hau potui quam hunc quem duco ducere.

Ritschl gives *pessimum* for *peiorem* in the first line, remarking that the first *peiorem* was caused by the second. I suggest :

Nam ego si iuratus hominem **NEQUAM** quaererem
 Peiorem hau potui quam hunc quem duco ducere.

Nequam easily fell out between *-nem* and *quae*, and the line was badly filled up with *peiorem*.

Pseudulus, 397.

Quoi neque paratast gutta certi consili
 Neque adeo argenti *neque nunc quid faciam scio*.

As Ritschl has shown, the words italicized are a manifest interpolation, the true words having been omitted by accident. This line, in my opinion, ran :

Neque adeo argenti **SPES EST USQUAM GENTIUM**.

The transcriber omitted the last words owing to his eye catching the *genti-* of *gentium* instead of the *-genti* of *argenti*. There are very many corruptions in Plautus, owing to this wholesale parablepsy. See, for instance, G. Goetz on the omissions in J in the British Museum (*Analecta Plautina*, p. 73, *seqq.*).

Pseudulus, 1174.

HA. Contumeliam si dices, audies. BA. Quotumo die
 Ex Sicyone huc peruenisti? HA. Altero ad meridiem.
 SI. Strenue mehercle isti, quamvis pernix hic homost.

Ritschl supplied *euge* at the beginning of the last line.
 But it is more probable that the line was

Strenue mehercle ISTINC isti! quamvis pernix hic homost,
 'You made a good journey from over there; a nimble fellow
 this'!!

Pseudulus, 296.

Heus tu, postquam hercle isti a mensa surgunt ARGENTARII
 Qui suum repetunt alienum reddunt nato nemini.

Plautus did not think the Roman banks, as a rule, very safe. *Argentarii* is not in the MSS.; but is, I think, a certain restoration, the first part of the word having been lost by its proximity to *surgunt*. The line was probably first copied *surguntarii*, and then the latter part of the word, *-arii*, struck out as making nonsense. Compare the exactly parallel passage in *Pers.*, iii. 3. 30, where the bankers are accused of levanting with their depositors' cash:

Mirum, quin tibi ego crederem: ut tu idem mihi
 Faceres, quod partim faciunt argentarii!
 Ubi quid credideris citius extemplo a foro
 Fugiunt quam ex porta ludis quom emissust lepus.

Ritschl in the blank reads *saturata cute* from Kampmann, of which he says, 'quod reicere poterit qui melius substituerit.'

Stichus, 44.

PA. Quam ob rem ego te hoc, soror, tam etsi's maior,
 Moneo ut tuum memineris officium :
 Et si illi improbi sint atque aliter nos faciant
 Quam aequom sit tam pol nequid magis sit
 Omnibus obnixe opibus nostrum
 Nos officium meminisse decet.

The two sisters Pamphila and Philumena are speaking of their absent husbands, of whom they have not heard a word for three years. Their father is thinking of taking them away from their husbands' houses, and breaking through their marriage contracts. Philumena is willing to bow to her father's commands, and represents to Pamphila how badly they have been treated by their husbands. To this Pamphila replies, with indignation, 'No wrong-doing on the part of others can excuse one's own wrong-doing.' The true emendation of the fourth line introduces a sentiment exactly in accordance with the moral she enforces :

Et si illi improbi sint atque aliter nos faciant
 Quam aequom sit, tam pol nequid *AEQUI* magis *IS* sit
 Omnibus obnixe opibus nostrum
 Nos officium meminisse decet,

'Although they treat us in a way they have no right to do, yet we must strive with all our might, by remembering our own duty, not to give them *a whit more right* to treat us so.' *Aequi* fell out after *nequid*, and *is* (dat.) after *magis*. The metre of the two first lines is bacchiac; and *magis*, as usual, is monosyllabic. Ritschl reads *noxiae* before *nequid*, and he is followed in this clumsy alteration by Fleckeisen.

Stichus, ii. 1. 181.

Set generi nostro haec redditast benignitas :
 Nulli negare soleo, si qui esum vocat.

Gelasimus says, 'My race have this good-nature: I never refuse when asked out to dinner.' Surely he ought to say, '*We* never refuse.' And the Ambrosianus gives us some help here, for it had five letters, now totally illegible, between *qui* and *-sum*. Therefore I believe the two lines should run :

Set generi nostro haec redditast benignitas :
 Nulli negare, si quis nos esum vocat,

or 'si qui *nos* esum vocat.' The copyist did not see that the sense ran on from the prior line, making *negare* explanatory of *haec benignitas*, and inserted *soleo*, changing *nos* to *me*.

Stichus, 270.

Set eccum Pinacium eius puerum, hoc vide.

Read :

Set eccum Pinacium eius puerum, hoc, SODES, vide.

Stichus, 476.

EP. Non edepol possum. GE. Quid gravare? Censeas :

Nescio quid † vero habeo in mundo. EP. I modo.

Gelasimus is pressing Epignomus to come to dinner, expecting that he will refuse and invite him instead. Epignomus says he cannot come. Gelasimus then pretends to tempt him by saying he has something good for dinner. In this line the corruption *vero* occurs. Ritschl reads *opi-pari*. It would be much better to obelize the word, as Fleckeisen does. Perhaps we should read :

GE. Nescio quid VERUBUS habeo in mundo. EP. I modo.

‘I have got something ready for roasting’; or, as Plautus uses the form *verum* for *veru*, ‘a spit,’ *Rud.* v. 2. 16. 18, we may keep *vero* in this sense, reading :

GE. Nescio quid EGO VERO habeo in mundo. EP. I modo.

Truculentus, Prol.

- Perparvam partem postulat Plautus loci
 De vestris magnis atque amoenis moenibus,
 Athenas quo sine architectis conferat.
 Quid nunc ? daturin estis an non ? adnuont. }
 5 †Melior me quidē vobis me ablaturum sine mora
 Quid si de vestro quippiam orem ? abnuont.
 Eu hercle in vobis resident mores pristini,
 Ad denegandum ut celeri lingua utamini.
 Sed hoc agamus, huc qua ventumst gratia.
 10 †Athenis tracto ita ut hoc est proscaenium
 Tantisper dum transigimus hanc comoediam.

The *Truculentus* is the most corrupt of the plays of Plautus. The scribe of the archetype of the Palatine MSS. seems to have grown indolent at the conclusion of his task, and the Ambrosianus, though more than usually legible, only assists us in a very small portion of the play, owing to its large lacunae. Hence the reader finds, when he has only BCD to fall back upon, a large number of riddles unanswered by any critic as yet.

Even in the very outset the prologue swarms with difficulties, and the verses printed above do not by any means represent the corruptions of the MSS., except in 5 and 10, the rest having been restored by the help of Priscian, Apuleius, and the critics. But the fifth and tenth verses, obelized above, have not been decently emended. For instance, can Spengel's *Credo me* in 5 claim to have even

the most distant resemblance to *Melior me* of the MSS.? I propose, removing the full stop at *adnuont*,

Quid nunc ? daturin estis an non ? adnuont,
Vel si orem quidvis, me ablaturum sine mora.
 Quid si de vostro quippiam orem ? abnuont.

I do not propose these exact words with any great degree of confidence, but I think I shall have led the critic into the right track, by pointing out—first, that *ablaturum* certainly depends on *adnuont* (cf. Bacch. 2. 2. 9); and secondly, that the strange corruption *Melior me* almost certainly grew out of *si orem*. The following may perhaps find more favour :

Si orem quid urbis, me ablaturum sine mora.

They promise to give anything that belongs to the city, for instance, the bit of ground asked for, without delay. It would be a different matter if they were asked for something of their own. They were ready enough to give what did not belong to them, like our legislators and juries.

Again, in verse 10 there has been no probable emendation proposed as yet : Spengel giving *Athenis haec sunt ita ut hoc est proscaenium*, an awkward reading, which does not account for *tracto* of the MSS. The following is not very far from the MSS. :

Athenas travolavit hoc proscaenium.

Travolo is a Plautine verb, Ep. 1. 1. 33. But I do not put this conjecture forward with much assurance.

Truculentus, 1. 2. 72.

Non hercle occide sunt mihi etiam fundi et aedis.

Read :

Non hércle omnino ego óccidi : sunt míhi etiam fundi et aédis.

Cf. Bacch. 231 : *Non omnino iam perii ; est reliquom quo peream magis*, a sentiment exactly parallel.

Truculentus, 2. 2. 17.

Quia tibi suaso infecisti propudiosa pallulam,
An eo bella eo quia clepis tibi armillas aeneas ?

So Spengel, save a difference in punctuation. But as *aeneus* is always trisyllabic in Plautus, we must insert HAS after *armillas*.

Truculentus, 2. 3. 10-13.

AST. Licet. DI. Audin etiam ? AST. Quid vis ? DI. Di me perduint,

Qui te revocavi : non tibi dicebam : i modo.

AST. Quid me revocabas, improbe nihilique homo,
Quae tibi [*vox*] mille passuum peperit moram.

So Spengel, and nearly so Geppert. But the true reading of the last line is clearly :

VAE tibi ! MI mille passum peperisti moram.

Passum is a dissyllable in Men. 1. 2. 64. There is no *vox* in the MSS. *Quae* is *Vae*, (*Q*)*uae*, and *mi* fell out before *mille*.

Truculentus, 2. 3. 21, 22.

Ut rem servare suavest ! vae misero mihi !
Post factum flecto qui ante partum perdidi.

Beyond changing *flecto* to FLEO EGO, there is no necessity to make any alteration in the line. The joke about

postpartores in 1. 1. 42 is bad enough without being dragged in again here. The only play is on the prepositions *post* and *ante*.

Truculentus, 2. 4. 90.

Iubebo ad istam quinque perferri minas.

As Spengel remarks, *perferre* in Plautus only means either *nuntiare* or *tolerare*. Strike out *per* and insert AURI, which fell out before *ferri*.

Truculentus, 2. 6. 54-59.

The soldier is giving presents, which he has brought from foreign parts, to his ungrateful mistress.

STR. Mea voluptas, adtuli eccam pallulam ex Phrygia tibi,
Tene tibi. PHR. Hocin mihi ob labores tantos tantillum dari !
STR. Perii hercle miser : iam mi auro contra constat filius.
Etiam nunc me nihili pendit. purpuram ex Sarra tibi
†Attuli tuas Ponto amoenas : tene tibi voluptas mea.
PHR. Accipe hoc. abducite intus hinc e conspectu Suras.

I have written the above passage as it has been emended by various critics, save in one place, which I have obelized. *Phrygia* is a correction of Kampmann's for *pari gra* of the MSS. *Ex Sarra*, 'from Tyre,' is an emendation of Jos. Scaliger for *exarat*, and that great scholar never made a happier hit. We come now to the obelized words which I have given according to the MS. reading :

Attuli tuas Ponto amoenas.

Here Spengel reads *Adtuli, tus Ponto amoenum*, for *tus* comparing Trin. 4. 2. 89, Aul. 2. 8, 15, about which quotations I shall have a word to say presently. For *amoenum* he compares Mil. 2. 5. 2 : *ut Arabio fumificem odore amoene*.

latter (probably) by Aristophanes. The smaller fish were preserved and brought to Athens and Rome in jars, and though in later times these were not very highly esteemed, in the time of Plautus or earlier they would be considered a luxury. The comic poet Cratinus writes in his *Dionysalexandrus*, ἐν σαργανίσιν ἄζω ταρίχους Ποντικούς, and Hermippus in his *Thesmophori* enumerating the products of different countries, says ἐκ δ' Ἑλλησπόντου σκόμβρους καὶ πάντα ταρίχη, presently adding ἀπὸ δ' αὖ Συρίας λιβανωτόν. Persius tells a young idle fellow to take to importing sardines, we may call them, from the Pontus: *saperdas advehe Ponto*.

I therefore propose to read, merely adding one letter, and taking away one, in the MSS. :

Attuli, ET VAS, PONTO MAENAS. tene tibi voluptas mea.

The *maena* was a small fish, which was preserved and much eaten at Rome, and probably was thought more of in early times than it was in the time of Martial. Those from the Pontus may have been a superior kind. Now *vas*, which is actually in *tuas* of the MSS., is the word used for the jar in which such fish were kept. Cf. Juv. 7. 119: Quod vocis pretium? siccus petasunculus et *vas Pelamidum*.

The reading I have proposed demands the apposition of *vas* and *maenas*, but there is no difficulty in this; on the contrary, the explanatory use of the word *maenas* is very happy—'Here, I've brought you purple, and a jar, sprats from the Pontus.' The words of Phronesium in reply also suit my reading very well. She tells an attendant to take the *vas* (hoc accipe): she orders the Syrian slaves she has been presented with to be led in, while, like a true woman, she keeps the finery beside her. *Maena* is a Plautine word: cf. Poen. 5. 5. 33: *Deglupta macna*.

Truculentus, 4. 3. 56-7.

Non vinum VIRIS moderari, sed vino VIRI solent,
 Qui quidem probi sunt ; verum qui improbus, si aquam bibit,
 Sive adeo CALET temeto, tamen ab ingenio improbus.

So this passage should, I think, be written. *Viris*, not *hominibus*, and *vir*, not *homines*, fell out. Spengel's *si urnas bibit* for *si aquam bibit* is unfortunate, although he keeps *caret* of the MSS.; but the change of this word to *calet*, suggested to me at lecture by Mr. W. G. Martley, seems undoubtedly right. The bad man is bad whether he drinks only water or is hot with wine.

Truculentus, 5. 10 seqq.

Phronesium draws a graphic picture of the expenses entailed by the birth of a child. I give the passage as Spengel has written it, italicizing those words where he differs from the MSS., and I at the same time differ from him :

Puero opust cibo, *opus est autem matri* quae puerum lavit,
 Opust nutrici, lacte ut habeat, veteris vini largiter,
 Ut dies noctesque potet, opust ligno, opust carbonibus,
 Fasciis opus est, pulvinis, cunis, incunabulis.
 Oleo opust, farina opust, *pulmento opust* totum diem.
 Numquam uno hoc die ecficiatur opus, quin opus semper siet.
 Non enim possunt militares pueri *ut catuli* educier.

This is a very good passage, and worth restoring. The *vetus vinum largiter* for the wet-nurse has its modern parallel in the 'porter, perfectly unlimited,' promised by Mrs. Chick to little Paul Dombey's nurse, Mrs. Toodle ; but the *ut dies noctesque potet* is in Plautus's own vein.

Now the first line, as written by Spengel and Geppert, is absurd : 'The child wants food, the mother too who

washes the child! The real mother did not wash the child; and to call the person who performed that office 'mother' is quite a novelty. The wet-nurse might possibly be called a foster-mother, but she is not brought in until the next line. And to say that she wanted food is weak: she always wanted food of course, not more than at any other time. Just as the nurse wanted a particular thing, namely, old wine, in order to give her plenty of milk, so that person who washed the child wanted a particular thing, namely soap. If this be so, inasmuch as the MSS. here give *opus est matri autē*, in that order, read:

Πύρο opust cibo, όpust NITRI autem quae puerum *pure* lavit.

Now it is sense. The child wants food, the woman who washes it clean cannot do without soap, the nurse must have her wine.

Soda, Hebrew נִיָּץ; Greek νίτρον, Latin *nitrum*, was used for washing, probably both by itself, and as the chief ingredient of soap. Thus in Jeremiah, ii. 22: 'For though thou wash thee with nitre, and take thee much sope, yet thine iniquity is marked before me, saith the Lord GOD.'

Νίτρον (λίτρον) was the chief ingredient in the soap of the Greeks, κονία. Aristophanes complains of the soap made with base soda by Cleigenes, Ran. 711; ψευδόλιτρος κονία. If we place this passage beside the others in Aristophanes, where κονία is mentioned, as Ach. 18, οὕτως ἐδήχθην ὑπὸ κονίας τὰς ὀφρῦς: Lys. 470, οὐκ οἶσθα λουτρὸν οἶον αἰδ' ἡμᾶς ἔλουσαν ἄρτι ἐν τοῖσιν ἱματιδίοις καὶ ταῦτ' ἄνευ κονίας, we shall see that the use of soda for cleansing purposes was as common among the Greeks as the use of soap among us. It was for toilet purposes that Praxinoa wanted the νίτρον she told her husband to bring from market, for φύκος, *paint*, is joined with it: Theocr. 14. 16, and Aristophanes mentions both these articles in his catalogue of a lady's dressing-room, Thesm. 2. Frag. 309. Ovid also twice

mentions *nitrum* among the ingredients which should go to compose the cosmetic he prescribes for beautifying a lady's complexion, Med. Fac. 73. 85.

For the use of *nitrum* by the Romans I need only quote Cic. Fam. 8. 14 : *Persuasum est ei, censuram lomentum aut nitrum esse: errare mihi videre: nam sordes eluere vult, venas sibi omnes et viscera aperit.* Caelius writes to Cicero that Appius thinks that his censorship is having the effect of a wash or of soda, *i.e.* soap, on his reputation.

The omission of *ei* before *quae* is strictly Plautine ; see instances quoted by Tyrrell, Mil. 691, 355. As to the insertion of *pure*, *pure lavare* is a regular Latin phrase, and *pure* may have easily fallen out after *puerum*.

And now as to the spelling of the word. *Nitri* will suit the passage as an emendation nearly as well as *NATRI*, but I think it quite possible that in Plautus's days the word was spelled *natrum*. The Romans probably became acquainted with the thing independently of the Greeks, and rightly made the Hebrew word into *natrum* ; but when they became acquainted with the Greek form *νίτρον*, they corrected their spelling to *nitrum*. The old vulgar and better orthography, however, if this theory is correct, triumphed in the long run.

The fifth line above is written in the MSS. thus :

Oleum opus est farina purus est totum diem.

Here I would propose :

Óleum opust, opúst farina, iúre opust totúm diem.

Jure, 'broth.' This is nearer than Spengel's. But Geppert's is perhaps better than mine :

Oleum opust, farina puero opust, opust totum diem.

In the last line printed above *ut catuli* is Spengel's

emendation for *et auio* of the MSS. We shall go nearer to that corruption by writing :

Non enim possunt militares pueri UT AVIUM educier.

That is, cannot be brought up as young birds are hatched. *Educere* means both to rear a child, and 'to hatch a young bird.' Plautus uses it in the latter sense : Poen. 1. 2. 143. Here he plays on this latter sense ; and the full construction would be, *non possunt militares pueri educier, ut (pulli) avium educuntur*, that is, without food or expense.

Truculentus, 5. 20.

Plus decem pondo †*moris* pauxillisper perdididi.

Nonius gives *amoris* for *moris*, showing that the corruption was before his time. Read :

Plus decem pondo MEI AERIS pauxillisper perdididi.

Truculentus, 5. 33-37.

STRAL. Meosne ante oculos ego illam patiar alios amplexarier ?
Mortuom hercle me odio satiust. abstine hoc, mulier, manum,
Nisi si mea manu hac machaera tete et hunc vis emori.

PHR. *Philippiari* satiust, miles, si te amari postulas.

Philippiari is one of Spengel's cleverest emendations for *Nihilippiari* of B. The verb is comically coined by Plautus : 'You had better make use of Napoleons if you wish for my love.' But though I heartily accept this emendation, I wish to point out that a line must have dropped out, for otherwise *Philippiari* has no point. It must be contrasted with some other infinitive in *-ari* or *-arier* ; an emphasis on *amari* would scarcely justify the coining of a

new word. And the MSS. begin the line with *Nihili*. Hence I suppose a line to have dropped out of this sort :

*Nihili facio tuam machaeram, mitte minitari mihi :
Philippiari satiust miles si te amari postulas.*

From the similarity between the commencement of the two lines, the scribe, when he got *li* in *Nihili*, went on at the *li* in *Philippiari*. For the meaning of the verse, cf. 56 infra, *Melius te minis certare mecum quam minaciis*. Of course it would make a much better play if we could place some word like *philosophari* in the restored line, but the Plautine use of this verb is only when real philosophizing is spoken of.

CATULLUS, 54.

Othonis caput oppido est pusillum,
†Et eri rustice, semilauta crura,
Subtile et leve peditum Libonis
Si non omnia displicere vellem
Tibi et Fabricio seni recocto.

The general sense of this queer poem was, I believe, for the first time correctly given by Vulpius : 'I could wish that Otho's puny head, his half-washed legs, and Libo's filthy habits, if not everything about them, might disgust you and Fabricius.' See Munro, *Criticisms and Elucidations of Catullus*, p. 126. I have omitted in the above version the obelized words *et eri rustice*, which have not been yet satisfactorily emended. I think another feature of Otho's appearance must have here been indicated. With Scaliger and most editors, I think *est* should be omitted in the first verse. I would give *os* at the end of

the verse, with Baehrens, but join it to what follows, and for *et eri rustice* read *Atrius pice*. The lines will then run :

Othonis caput oppido pusillum, os
 ATRIUS PICE, semilauta crura,
 Subtile et leve peditum Libonis
 Si non omnia, displicere vellem,
 Tibi et Fabricio seni recocto.

We have now Otho's *swarthy visage* added to his other unprepossessing features—his puny head and dirty legs. With *atrius pice* compare Ovid, *Art.* ii. 658 :

Nominibus mollire licet mala. Fusca vocetur
 Nigrior Illyrica cui pice sanguis erit.

Id. *Met.* xii. 402 :

. . . Totus pice nigrior atra.

Id. *Pont.* xiv. 45 :

Adde quod Illyrica si iam pice nigrior essem
 Non mordenda mihi turba fidelis erat.

You see how close ATRIVSPICE is to ETERIRVSTICE. The comparative *atrrior* is found in Plaut., *Poen.* v. 5. 11 :

Ita replebo atritate, atrrior multo ut siet,
 Quam Aegyptii.

The second part of this emendation is independent of the first, as *caput* might, by leaving out *est*, be made to agree with *atrius* as well as with *os*. If it be said that Catullus would not have used *atrius*, read *Taetrius*, which is nearer still to the MS.

LUCRETIVS, i. 558.

Sed quia multa sibi cernunt contraria *nasci*,
 Et fugitant in rebus inane relinquere purum
 Ardua dum metuunt amittunt vera viai.

Mr. Munro reads *nasci*; A gives *muse*; B, *mu*. Hence I would suggest :

Sed quia multa sibi cernunt contraria IN USU.

When they come to the application of their theory to actual practice, they find themselves confronted by many difficulties. Cf. Plaut. Bach. 1. 1. 28. quia istaec lepida sunt memoratui : Eadem *in usu* atque ubi periculum facias aculeata sunt. The confusion of *in* and *m* is common in Latin MSS., hence *in usu* may have become *musu*.

LUCRETIVS, iii. 453.

Claudicat ingenium delirat lingua *labat* mens.

Labat omitted in the MSS. is supplied by Lachmann. Perhaps the archaic *vagat* is something more likely after *-ngua*. *Vagare* was properly = *φοιτᾶν*, to roam wildly distraught. Accius, 236 (Ribbeck).

Vagant matronae percitatae [insania].

Pacuvius, 303 (*id.*).

Triplici pertimefactus maerore animi incerte errans vagat.

The MSS. of Nonius give to Turpilius (Ribb. 121) :

Vultu vecordi vagas insania.

LUCRETIUS, iv. 414-419.

At conlectus aquae digitum non altior unum
 Qui lapides inter sistit per strata viarum
 Despectum praebebat sub terras impete tanto
 A terris quantum caeli patet altus hiatus;
 Nubila dispicere et †caelum ut videre videre
 Corpora mirando sub terras abdita caelo.

Mr. Munro now obelizes *caelum*, rightly beyond the possibility of doubt, pointing out that it arose either from *caelum* in the preceding, or *caelo* in the succeeding line, and giving the clue to what I think is the true reading by suggesting *volucrum*, *avium*. I would read:

Nubila dispicere et *viva* ut videre videre
 Corpora mirando sub terras addita caelo.

The alliteration is strongly in favour of *viva*. Cf. v. 993:

Viva videns vivo sepeliri viscera busto;

and Lucretius uses *corpora viva*, 2. 879:

Ergo omnes natura cibos in corpora viva
 Vertit et hinc sensus animantum procreat omnes.

In the next line I think *addita* is probably right, not *abdita*. The living creatures are not 'hidden' in the sky. I cannot conceive how they could be. They are set on the sky, as it were. *Addere* is often 'to place upon,' 'to set on.'

LUCRETIIUS, iv. 1123-1127.

Labitur interea res et Babylonica fiunt,
 Languent officia atque aegrotat fama vacillans.
 †Unguenta et pulchra in pedibus Sicyonia rident
 Scilicet et grandes viridi cum luce zmaragdi
 Auro includuntur teriturque thalassina vestis.

Mr. Munro has rightly condemned *unguenta*, but his reading *Huic lenta* is scarcely convincing. I propose SEGMENTA 'flounces,' which it seems to me is a very likely word to match the *Babylonica*, the *Sicyonia*, the *zmaragdi*, and the *thalassina vestis*, and *rident* suits it very well too. Ovid, *Art.* 169, speaking of a woman's dress :

Quid de veste loquar ? nec vos, segmenta, requiro,
 Nec quae bis Tyrio murice lana rubes.

Cf. Juv. ii. 124 ; Sen. Ep. viii. 6. Valerius Maximus tells us, v. 2. 1, that the senate 'permisit quoque his (Veturiae and Volumniae) purpurea veste et aureis uti segmentis.'

LUCRETIIUS, 5. 305-315.

Denique non lapides quoque vinci cernis ab aevo
 Non altas turris ruere et putrescere saxa
 Non delubra deum simulacraque fessa fatisci,
 Nec sanctum numen fati protollere finis
 Posse neque adversus naturae foedera niti ?
 Denique non monimenta virum dilapsa videmus
 †Quaerere proporro sibi cumque senescere credas,
 Non ruere avolsos silices a montibus altis
 Nec validas aevi vires perferre patique
 Finiti ?

Mr. Munro originally edited the obelized line, the MS. reading of which I have given above, thus :

Aeraque proporro solidumque senescere ferrum ;

not now, on consideration that this does not give the true Lucretian meaning to *proporro*, a word peculiar to Lucretius, the meaning of which is best shown by citing the passages where it occurs. In 1, 2. 979, the *primordia* are supposed *proporro*, 'in their turn,' to inquire about their own *primordia*. In 3. 275, 281, the soul is said to have a soul of its own, *proporro*. If we were to turn into Latin the expression, 'there are wheels within wheels,' we might add *proporro*. The bird-cage Sam Weller noticed in the Fleet Prison was a prison within a prison, *proporro*; so in the well-known lines :

So naturalists observe a flea
Has smaller fleas that on him prey;
And these have smaller still to bite 'em,
And so proceed ad infinitum,

the different stages might be expressed by the word *proporro* : on consideration, I say, of the force of this word, Mr. Munro reads :

Denique non monimenta virum dilapsa videmus
Quaerere *proporro* sibi, sene senescere credas,

which he thus renders in his translation : 'Then see we not the monuments of men, fallen to ruin, ask for themselves as well whether you'd believe that *they* decay with years,' giving *sene* for *cumque*. He supposes *sene* to have fallen out before *senescere* and to have been filled up by *cumque*. If I am allowed a somewhat similar hypothesis, I will give, I think, a reading as good as Mr. Munro's, and more in accordance with the use of *proporro* which I have explained. I propose therefore :

Denique non monimenta virum MONIMENTA videmus
Quaerere *proporro* sibi, conqu *senescere CERAS*.

'Do we not see the monuments of men seek monuments for themselves in their turn, and waxen images grow old?'

I suppose one *monimenta* to have been omitted intentionally by the scribe, who did not understand that one *monimenta* was subject and the other object, and the gap to have been filled up by the word *dilapsa*, which is unnecessary. The monuments of men fall to decay and want monuments for themselves: the waxen images set up in the halls of men to perpetuate the memories of their ancestors themselves grow old. *Conque senescere* was given by I. Voss.

It is not absolutely necessary to eject *dilapsa* and substitute a second *monimenta*, as the single *monimenta* may be taken twice.

LUCRETIVS, vi. 1134-1137.

Nec refert utrum nos in loca deveniamus
 Nobis adversa et caeli mutemus amictum,
 An caelum nobis ultro natura †corruptum
 Deferat aut aliquid quo non consuevimus uti,
 Quod nos adventu possit temptare recenti.

For *corruptum* Mr. Munro formerly read Bentley's conjecture *alienum*, but he now admits *corruptum*, Lucilius having *ore corrupto*. It is strange that no grammarian has cited this *corruptum* from Lucretius if he wrote it, as well as the solitary example from Lucilius half a century older. Surely it would have been ten times more remarkable in Lucretius. I have not looked up the passage in Isidore referred to by Mr. Munro to show that he read *corruptum* here; but may it not have been rather derived from *corumpat*, in 1124, than from this line? It certainly reads more like it. Whether *corruptum* (or *corumptum*, the old form) be genuine or not, I have a reading to propose which

gives very good sense, and out of which *corumptum* may readily have sprung. Read :

An caelum nobis ultro natura PARUM APTUM
Deferat aut aliquid quo non consuevimus uti.

SIBILARE.

Is *sibilare* ever a transitive verb governing an accusative case and meaning *to hiss at*? The reader, if he turns to Forcellini, Scheller, or Lewis and Short, will at once answer 'Yes'; for in all those dictionaries he will find two instances of the active meaning given: Cic., *ad Att.* ii. 19, and Hor., *Serm.* i. 1. 66. These are the only instances given, and so far I have not been able to find any others, and shall be greatly obliged if any reader will kindly indicate them to me if any such exist.

But if we examine the passage in Cicero we shall find that *sibilare* is certainly intransitive there, not transitive. Cicero, writing of Caesar, Pompeius, and their then adherents, says: *Populares isti iam etiam modestos homines sibilare docuerunt*, which means, obviously, 'those men of the people have taught even moderate men to hiss.' It is difficult to see how there could be even a doubt about the construction. There then remains only—

HORACE, *Serm.* i. 1. 66.

Ut quidam memoratur Athenis
Sordidus ac dives populi contemnere voces
Sic solitus: populus me sibilat, at mihi plaudo
Ipse domi simul ac nummos contemplor in arca. .

Here undoubtedly, if the MSS. are sound, *sibilare* governs an accusative. But if we approach the passage with the conviction that this is the one passage in all classical Lati-

nity where *sibilare* is used actively, we shall be disposed to suspect corruption and to attempt to remedy it. Some may say the rarity of the verb in an active sense may be an accident: the idea of hissing at may not have occurred to any writer. That is not so: Cicero several times wants to express this idea, and how does he do so? Not by *sibilare*, although it would often have been a great convenience to him to do so. No: he says, *Rosc. Com.* 11, *sibilis explodebatur*, not *sibilabatur*: *Att.* 2. 18, *sibilis consecretantur*, not *sibilant*: *Ib.* 19, *sibilis conscissi*, not *sibilati*. Impelled by these reasons, I am driven to suspect that in the passage in Horace we should read:

populus si sibilat, at mihi plaudo
Ipse domi, simul ac nummos contemplor in arca.

The first cause of corruption in a manuscript is the omission of one or more similar syllables; the second cause is the filling up of the lacunae in subsequent copies. The ancient scribes, and indeed the ancient school of critics, had not fully recognized this cause of corruption, and often filled up a gap wrongly, when the correction was easy, had they recognized the truth of this theory. Here they put in *me* instead of *si*, lost before *sibilat*.

At is repeatedly used after *si*. *Si* introduces a clause where a circumstance disadvantageous to the chief subject is mentioned, and *at* introduces the advantageous circumstance which counterbalances it. Hence we should expect a priori to find, what is the case, that *at* more often follows *si non* than *si*. But that is by no means a rule, as the following instances will prove. Plautus, *Bacch.* iv. 8. 46: *si tibi est machaera at nobis vervinast domi*. Id. *Bacch.* ii. 3. 130: *si illi sunt virgae ruri at mihi tergum domist*. Catullus, xxx. 11: *si tu oblitus es, at di meminerunt*. Verg. *A.* i. 543: *si genus humanum et mortalia temnitis arma at sperate deos memores fandi atque nefandi*. Many more in-

stances might be cited. I therefore, if not corrected by any reader of *Hermathena*, would propose the substitution of *si* for *me*: 'Though the populace hisses, I applaud myself at home, once I have my strong box to gaze at.'

HORACE, *Serm.* i. 9. 54-56.

Velis tantummodo: quae tua virtus
Expugnabis: et est qui vinci possit, eoque
Difficiles aditus primos habet.

I know of no passage in Latin where *est qui* means what it is supposed to mean here. *Est qui* generally means, 'there is one who,' 'there are people who.' The sense intended here is usually expressed by *is est qui*. Cic. *Att.* 7. 8: Itaque *is* in illum sum quem tu me esse vis. *Off.* 3. 12: Quod si *is* foret Panaetius, qui virtutem propterea colendam diceret. *Fam.* 5. 12: neque enim tu *is* es qui, qui sis, nescias. *Att.* 7. 5: Nam ego *is* sum qui illi concedi putem utilius esse quod postulat, quam signa conferri. 10. 10: Sed ego *is* non sum qui statuere debeam. *Ep. ad Brut.* 416: Ego vero *is* sum qui non modo non supplicem sed etiam coerceam postulantes ut sibi supplicetur.

The last three passages are quoted by Bentley against Dousa's reading *poscit*, showing as they do that the verb must be in the subjunctive. But Bentley does not say a word about the omission of *is* in the passage before us, or the ease with which it may be supplied. Read:

Expugnabis: *is* est qui vinci possit eoque
Difficiles aditus primos habet.

Is was omitted on account of following *-is* in *expugnabis* and its place was supplied by *et*. Some might prefer to

read 'Expugnabit: is est' cet: making *virtus* the nom. to *expugnabit*: and the Codex Sangallensis has *expugnabit* (prima manu); but it will be found that after such phrases as *quae tua virtus* the nominative to the verb that follows is not the quality but the person who possesses it. Cic. *Fam.* 13. 78: *quae tua natura est, dignum tua amicitia atque hospitio iudicabis.* 7. 2: *qui meus amor in te est confecissem cum coheredibus.*

HORACE, *Serm.* 2. 3. 226-232.

Hic simul accepit patrimoni mille talenta
 Edicit piscator uti, pomarius, auceps,
 Unguentarius ac Tusci turba impia vici
 Cum scurris fator cum Velabro omne macellum
 Mane domum veniant. Quid tum? venere frequentes.
 Verba facit leno: quicquid mihi, quicquid et horum
 Cuique domi est, id crede tuum et vel nunc pete vel cras.

All the best copies give *quid tum? venere frequentes*, a reading which, if it had been proposed by some modern emendator, would have certainly exposed him to derision. Bentley's conjecture is better:

Mane domum veneant; qui cum venere frequentes
 Verba facit leno.

But the remarkably parallel passages quoted by Bentley to illustrate the use of *venere frequentes* show that both *qui cum* and *quid tum* are out of place here. Cic. *pro Quint.* 6: *Ipse una necessarios corrogat ut ad tabulam Sextiam sibi adsint hora secunda postridie: veniunt frequentes. Testificatur ille cet.* Liv. 1. 50: *In diem certum ut ad lacum Terentinae conveniant, indicit: esse quae agere de rebus communibus velit: conveniunt frequentes prima luce.*

In these passages *venere frequentes*, and *conveniunt frequentes*, follow without any *quid tum* or *qui cum* or anything else intervening. And another thing strikes me when comparing the passage from Cicero with that in Horace, namely, that in the latter there is no hour mentioned: nothing but *mane*. This is too vague. The Roman *mane*, like our morning, included all the time from sunrise to mid-day. There is nothing in the passage corresponding to *hora secunda* in the remarkably parallel passage from Cicero. I therefore propose to read:

Mane domum veniant QUINTA: *venere frequentes*,
 or
 Mane domum veniant: QUINTA *venere frequentes*.

Quinta scil. *hora* at the fifth hour: somewhere about eleven o'clock. *Hora* is often omitted. So Horace, *Serm.* 2. 6. 34:

Ante secundam

Roscius orabat sibi adesses ad Puteal cras.

Carm. 3. 19. 8:

Et *quota* Pelignis caream frigoribus taces.

Martial, 8. 67:

Mane veni potius: nam cur te *quinta* moretur?
 Ut ientes sero, Caeciliane, venis.

This last passage, I confess, appears to tell against my conjecture; for in it *mane* and *quinta* are contrasted together. But it is not necessarily decisive against it: the fifth hour may be morning or not morning, according to the relation in which it is used. And if the second reading suggested above is true, Martial might have had a reminiscence of this passage when writing his epigram.

The young man, who slept till late in the morning, appointed an hour at which he would be up, or his visitors

came at an hour at which they surmised he might be up, and by which time their own business in the markets would be over. Horace himself habitually lay in bed *ad quartam*. Persius satirises the idle young men of his day who lie snoring *quinta dum linea tangitur umbra*. Cicero, in *Pisonem* 13, says that he and C. Piso called on L. Piso at the fifth hour. This L. Piso seems to have been a dissipated man like our Nomentanus. Cicero says they found him 'involuto capite,' wearing slippers and stinking of wine: *Meministine, coenum, cum ad te quinta fere hora cum C. Pisone venissem, nescio quo e gurgustio te prodire involuto capite, soleatum? et cum isto ore foetido taeterri-
mam nobis popinam inhalasses, excusatione te uti vale-
dinis, quod diceres, vinolentis te quibusdam medicaminibus solere curari?*

OVID, *Am.* 1. 8. 65.

Nec te decipiant veteres *quinquatria* cerae
Tolle tuos tecum, pauper amator, avos.

The word *quinquatria* has no place or meaning here. It did not require great acumen or scholarship on the part of Heinsius or Scriverius to see that *atria* must come in. The words *atria* and *cerae* are regularly joined together. Juvenal, 8:

Tota licet veteres exornent undique cerae
Atria.

Ov. *Trist.* 1. 591:

Perlege dispositas generosa per *atria* ceras,

and so in many other passages. There is not the most remote doubt that *atria* must be introduced; but the emen-

dations for the beginning of *quinquatria* proposed do not commend themselves to me. I propose to read :

Nec te decipiant veteres, QUANTA ATRIA, cerae :
Tolle tuos tecum pauper amator avos.

Quanta atria, by the omission of one *a*, easily became *quantatria*, which was readily mistaken for *quinquatria*. The meaning then will be : 'Let not images of ancestors, extending through the whole length of his halls, beguile thee.' For this use of *quantus*, cf. *Met.* 4. 656 : *Quantus erat, mons factus Atlas.* *Her.* 3. 49 : *Vidi, quantus erat, fustum tellure cruenta.*

†

A. PALMER.

Sept. 14, 1881.

P.S.—The important edition of the *Truculentus* by F. Schoell has just reached me. The only points in which he has anticipated me are 1. 2. 72, from Brix : the obvious insertion of *viris* and *viri*, 4. 3. 57 ; in 5. 16 he reads *avis* where I give *avium*.

Dec. 1, 1881.

JOWETT'S THUCYDIDES.

I.

DR. JOWETT'S translation of Thucydides does not require his eloquent justification: 'if Greek Literature is not to pass away, it seems to be necessary that in every age some one who has drunk deeply from the original fountain should renew the love of it in the world, and once more present that old life, with its great ideas and great actions, its creations in politics and in art, like the distant remembrance of youth, before the delighted eyes of mankind.' His translation has these uses, but it has the further advantage of enabling scholars to take a rapid glance over the matter of Thucydides, without having their attention distracted by the countless questions which the Greek text raises in the mind of the classical reader. Thucydides is essentially a writer in whom matter outweighs form, and everybody who has read a classical author for the sake of the matter will remember how much his views were cleared by a restatement in the most modern shape.

That any translation, however excellent, will have much effect on the non-classical reader is very doubtful. Conservatives objected to railways that they destroyed the effects of travel by suddenly transporting the tourist from one centre to another, leaving no time for the gradual alteration of ideas which prepared him for the great change. And the change from a modern to an ancient writer is so great as to be too much apparently for any, save those who have been gradually attempered to the

contrast by the long and laborious course of classical training.

Of translation, as of most other things, there are two schools—the literal and the free. The literal deserves Dr. Johnson's denunciation, and justifies Voltaire's profanity. The free translator, on the other hand, aims at giving us his view of the meaning, and is bound, at any cost, to be unambiguous. The one gives us a portrait, the other a cast after execution.

Dr. Jowett's version has the great merit of making clear the rendering he adopts. The notes, too, are admirably arranged, and no time is lost in distinguishing the different views. Dr. Jowett marks his preference, and so can the reader.

Before we approach any disputed passage in Thucydides, one thing is needful: 'What theory of his language must we adopt?' This is all-important, and must be decided one way or the other; the two views cannot be reconciled. Is Thucydides to be dealt with as having a style of his own—a style which, as is natural, belongs to a pre-grammatical period, or is he to be clipped into shape, like a box-tree or a poodle, by the shears of the Atticists?

Emendation has done the greatest service to scholarship. It has caused a rational investigation of the meaning of an author, and the *στροφή* of the emendator is all alive to discover parallels in support of his new-born reading. But those who do not share these emotions must reflect that if we had no MSS. we should have no authors, and that MSS. are emended by means of MSS. Now, there are two views, one of which must be given up. This may be seen from the following:—Mr. Rutherford, in his edition of Phrynichus, which deserves the gratitude of every student of Attic prose, boldly states that, if corrected, 'the texts of Attic writers would present as few errors in syntax and in the form of words as the best French

classics' (p. viii.). Again, he tells us that Phrynichus, 'like all true scholars, disregarded exceptions, and considered the knowledge of anomalies not science, but pedantry. Till the rules are known—and every usage which is true in three cases out of four should be elevated into a rule—no attempt need be made to elucidate departures from them' (p. 266). In the first place, Mr. Rutherford answers himself: 'to a law of nature there is in the last resort no exception; but a grammatical rule cannot fail to be sometimes contravened, as long as the human mind is subject to mistake' (viii.). But what Mr. Rutherford calls mistake may be really the incidence of another line of thought. A grammatical rule is an abstract of a set of cases, and covers nothing more. To stretch it further is as absurd as to lay down a canon that no man is over six feet, and then to ignore all in excess, or rather, like the emendator, to 'reform them altogether.' Again, Phrynichus tells us his method—*ἡμεῖς οὐ πρὸς τὰ διημαρτημένα ἀφορῶμεν, ἀλλὰ πρὸς τὰ δοκιμώτατα τῶν ἀρχαίων*. That is, Phrynichus sought to lay down a canon, by following which perfect purity was secured, but not by any means to nullify an existent variation. Phrynichus wrote in the days of Commodus. His standard of correct *prose* was the Old Comedy, Plato the philosopher, and the Orators. But in every case it was a standard of usage, not of authority. There was no academy to fix a day after which participles were not to be declined; and it is obvious that the Old Comedy, Plato, and the Orators, have one point in common—an approximation to the language of conversation. Now, conversation tends to uniformity, as is shown by the prevalence of slang, the origin of which is unknown to most of those that use it. The standard of Phrynichus is a 'shield, and not a sword.' Arnold, on IV. 84, laid down the alternative correctly—'Unless we decide that the text is corrupt, and proceed at

once to correct it, there is no remedy but that the explanations of this and many other passages must be harsh and open to objection, because the text is not made out according to the common rule of language. We have, therefore, a choice of anomalies, and it is much easier to see what is clearly wrong than to determine what is right.' Mr. Munro, who is by no means slow with the knife, observes: 'Cultivated language is made up of inconsistent metaphors, which time has smoothed over'; and if ever English becomes a dead language, a critic would have some difficulty in proving that the Frenchman's 'squeeze the lady to sing' was wrong.

† The emendator, like the law, employs convenient fiction. At one time the scholiast or the copyist is below the level of idiocy; at another he is dark with excess of light, and deliberately corrupts one author to prove he has read another, though his doings may not be unearthed for centuries. And if, on the one hand, we can point to printers' errors, it is only fair to appeal to the accuracy of copying clerks in matter where, from the frequent recurrence of certain phrases, *διππογραφία* and *ἀβλεψία* ought to be rife. It must be granted, there is proof of corruption in our text, iv. 45, in a proper name; but in general the safest guide to the interpretation of Thucydides is the *logic* of the passage, or result of all the words, as opposed to the stricter construing of the later grammarians. Conington has done good service in Virgil, by showing that one word is not to be shackled to another, but left loose, to qualify the whole sentence. In this way something may be done to bring out the meaning of Thucydides. He is not Attic, high and dry: are we to make Milton talk like Wycherley? And of English critics, Conington and Munro confess that, like Cato, they have been too hasty, feeling that increase of knowledge is in favour of conservatism.

One of the most remarkable and difficult portions of Thucydides is the Introduction. As to its historical value, Arnold considers that if some Roman had done the same for Rome, much of Niebuhr's work would have been unnecessary. But, it seems, that the very circumstance which recommends it to Arnold—its political tone—is the very reason why it is an unsafe guide. Men in early ages are not governed by abstract motives, like the Balance of Power. We know that William the Conqueror invaded France to avenge a jest, and that James of Scotland invaded England because the Queen of France sent him her glove, and in either case *la haute politique* is out of the question. But this does not affect its merits as an outline of Greek progress, and a modern would probably have given us an octavo volume, if not two, before we came to the fatal name Epidamnus.

The first great difficulty is—

I. 2. 6.

καὶ παράδειγμα τόδε τοῦ λόγου οὐκ ἐλάχιστόν ἐστι, διὰ τὰς μετοικίας εἰς τὰ ἄλλα μὴ ὁμοίως αὐξηθῆναι.

The drift is: *Thucydides wrote, because the war was the greatest event in history ; the greatest, because evidence, though not the clearest, shows that previous things, either in the way of war or otherwise, were not on a large scale.* τὰ γὰρ πρὸ αὐτῶν καὶ τὰ ἔτι παλαιότερα σαφῶς μὲν εὐρεῖν διὰ χρόνον πλῆθος ἀδύνατα ἦν· ἐκ δὲ τεκμηρίων, ὧν ἐπὶ μακρότατον σκοποῦντί μοι πιστεῦσαι ξυμβαίνει, οὐ μεγάλα νομίζω γενέσθαι, οὔτε κατὰ τοὺς πολέμους οὔτε εἰς τὰ ἄλλα. In this case τοῦ λόγου would be the assertion οὐ μεγάλα οὔτε κατὰ τοὺς πολέμους οὔτε εἰς τὰ ἄλλα : the cause of this arrested development was the shifting of population ; and an instance of the effects of shifting is Attica, which increased, because its population abided. If this is so, there is no subject to αὐξηθῆναι, and the clause

may be rendered, referring ἐς τὰ ἄλλα to peaceful progress, *that shifting checked the tendency to progress in civilization is shown by the following illustration of my main proposition, the pettiness of antiquity*, and μὴ ὁμοίως then = *to what it would otherwise have been*; or more freely, *shifting was the cause of the slow growth of civilization*. The pettiness of antiquity is dwelt on in—τῶν παλαιῶν ἀσθένειαν, 3, 1; ὥστε μὴ ἡσυχάσασα αὐξηθῆναι, 12, 1; κωλύματα μὴ αὐξηθῆναι, 16, 1; οὕτω πανταχόθεν ἢ Ἑλλάς ἐπὶ πολὺν χρόνον κατείχετο μήτε κοινῇ φανερόν μηδὲν κατεργάζεσθαι, κατὰ πόλεις τε ἀτολμοτέρα εἶναι, 17, 2. αὐξηθῆναι without a subject, is supported by παρέχεσθαι, 3, 1; ἀτειχίστων, 2, 2; ἐπαγομένων, 3, 2; πλωϊμωτέρων, 7, 1.

¶ If the pettiness of antiquity is the theme of the preface, the logic would bear us out in rendering αὐτοῖς, in καὶ ἐγένετο αὐτοῖς ἐς τόνδε τὸν πόλεμον ἢ ἰδίᾳ παρασκευῇ μείζων ἢ ὡς τὰ κράτιστά ποτε μετὰ ἀκραιφνοῦς τῆς ξυμμαχίας ἦνθησαν, 19, 2, *either side*, that is, either of the great contending powers was greater at the beginning of the war than they were both together, when united against Persia. The Persian War is—*longo intervallo*—the next biggest event, 23, 1.

In 9, 2, surely σαφέστατα Πελοποννησίων is the *most certain Peloponnesian history*; Thuc. wanting a sure result rather than local colouring.

In 9, 3, καὶ ναυτικῷ τε gives Dr. Jowett occasion for tabulating the uses of τε. Our Dr. Kennedy pointed out that τέ, in *Agam.* 1, 556, meant *too*. τὲ, in Hermann's language, meaning *adjunction*, naturally coupled things, *i.e.* nouns denoting different things. The next step was to use it with nouns denoting the same person but limited by the article. The next step was to omit the article ἀλόχου κερκηλάτου τ' ἀηδόνης, *Syrph.* 59; and its last use was to tack epithets, as in ἀνδρίῳ τε βιαίῳ θανοῦσα συμφορᾷ, *Hērph.* 813-4. It is easy to call it, when it troubles us, a relic of Parataxis, but it will always be found to call attention to something which strengthens the sense.

In 22, 4, κατὰ τὸ ἀνθρώπειον does not mean, as Mr. Shilleto takes it, *human reasoning*, but as Mr. Jowett, *the order of human things*.

In

25, 4.

περιφρονούντες δὲ αὐτοὺς, καὶ χρημάτων δυνάμει ὄντες κατ' ἐκείνον τὸν χρόνον ὁμοῖα τοῖς Ἑλλήνων πλουσιωτάτοις καὶ τῇ ἐς πόλεμον παρασκευῇ δυνατώτεροι, ναυτικῶ δὲ καὶ πολὺ προέχειν ἔστιν ὅτε ἐπαιρόμενοι, καὶ κατὰ τὴν τῶν Φαίακων προενοίκησιν τῆς Κερκύρας, κλέος ἔχόντων τὰ περὶ τὰς ναῦς.—Badham cuts out αὐτοὺς and ὄντες, and reads ἐς τότε, on the ground that περιφρονῶ is not καταφρ., or ὑπερφρ. But is there not a contemptuous sense in περιφρονῶ φν ἥλιον, Ar. *Nub.* 225, 'people thought you a god: I see how you are made, thanks to Anaxagoras, and don't think much of you?' So, our *examine*; ἔστιν ὅτε denotes a smaller degree than ἐνίοτε, *with a vein of boasting, a dash of it*.

36. 1.

Καὶ ὅτε τάδε ξυμφέροντα μὲν δοκεῖ λεγεσθαι, φοβεῖται δὲ μὴ δι' αὐτὰ πειθόμενος τὰς σπονδὰς λύσῃ, γνῶτω τὸ μὲν δεδιὸς αὐτοῦ, ἰσχὺν ἔχον, τοὺς ἐναντίους μᾶλλον φοβῆσον, τὸ δὲ θαρσοῦν μὴ δεξαμένου, ἀσθενὲς δὲν, πρὸς ἰσχύοντας τοὺς ἐχθροὺς ἀδεέστερον ἐσόμενον.

Here Dr. Jowett rejects Mr. Shilleto's rendering, and translates *he may make a present of his fear to the enemy*; in answer to S.'s question, does any passage in Th., where δεδιέναι is usual, suggest *coward fear*, he cites δεδιότας αὐ ἀλόγως, ii. 65, and βαρβάρους, οὓς νῦν ἀπειρία δεδίτε, iv. 126. Dr. Jowett allows ἀλόγως to qualify the first: does not ἀπειρία qualify the second? In Homer, φέβεσθαι, *to fly in haste*, is opposed to διωκόμεν; and in *Euthyphro*, δέος is connected with αἰδώς.

But the use of φοβῶ, δέδια, and θαρσῶ in the same sentence looks as if Thuc. was airing his synonyms.

37, 2.

οὔτε παρακαλοῦντες αἰσχύνεσθαι, *whenever they called him in*: J. Is it not rather, *when they call him to character*? The Greek states appeal to one another as witnesses. Now, persons such as the Corinthian describes would not feel shame at asking an ally to assist them in aggression, but would not like to be held up to the public opinion of Greece; so, *πρότ', ἢν δέ ποῦ τι προσλάβωσιν, ἀναισχυντῶσι*.

40, 6.

εἰ γὰρ τοὺς κακόν τι δρῶντας δεχόμενοι τιμωρήσετε, φανεῖται καὶ ἃ τῶν ὑμετέρων οὐκ ἐλάσσω ἡμῖν πρόσσεισι, καὶ τὸν νόμον ἐφ' ὑμῖν αὐτοῖς μᾶλλον ἢ ἐφ' ἡμῖν θήσετε.

If you mean to receive and assist evil-doers.—J. Badham, on the grounds, that τιμωρεῖν is aliquem poena afficere, that φανεῖται ἃ is not ἔστιν ἃ, reads εἰ γὰρ τοὺς κακόν τι δρῶντας δεχόμενοι φανείσθε, καὶ τῶν ὑμετέρων οὐκ ἐλάσσω ἡμῖν πρόσσεισιν. This is certainly clipping Th. into shape: B. also objects that if τιμωρεῖν = alicujus causam suscipere, δεχόμενοι should be δεξάμενοι. But if we render it, *if you are to punish us by entertaining the complaints of rebels, two, you will find, can play at that game*, φανεῖται, of course, as always, referring to what will be a notorious fact. Of course, *complete recognition* would require δεξάμενοι, but δεχόμενοι is the first step, *sympathising*.

37, 1.

Αναγκαῖον Κερκυραίων τῶνδε οὐ μόνον περὶ τοῦ δέξασθαι σφᾶς τὸν λόγον ποιησαμένων, ἀλλ' ὥς καὶ ἡμεῖς τε ἀδικοῦμεν καὶ αὐτοὶ οὐκ εἰκότως πολεμοῦνται.

It does not appear necessary, with Shilleto, either to traject or to expunge καὶ, for it emphasizes the whole

clause *that really we-are-the-wrongdoers-and-they-are-the-wronged*—in this transaction.

72. It seems odd that Th. does not tell us what the embassy was about; and the reasons for the speech—to remind and to instruct—appear, to say the least of it, highly rhetorical, especially as the Athenians deny the jurisdiction of the assembly.

73, 2.

τὰ δὲ Μηδικὰ καὶ ὅσα αὐτοὶ ξύνιστε, εἰ καὶ δι' ὅχλου μᾶλλον ἔσται ἀεὶ προβαλλομένοις, ἀνάγκη λέγειν.

Is disagreeable to us, preferred by J. But surely is it not rather, *disagreeable to the hearers, this perpetual harping on Marathon, &c.*? We, who owe more to Marathon than any Athenian, ought in gratitude to forgive the inevitable allusions to the war in the Greek writers, from Eupolis and Demosthenes.

77, 1.

ἐν ταῖς ξυμβολαῖαις πρὸς τοὺς ξυμμάχους δίκαις, *In our suits with our allies regulated by treaty*, J. What are αἱ ξυμβόλαιαι δίκαι? I take them to mean, *The Law of Obligations—Contract and Tort*. Plato mentions τῶν ἐκουσίων ξυμβολαίων, *Rep.* 556 a; Aristotle mentions τῶν ἐκουσίων συμβολαίων, *E. N.* IX. i. 9, which plainly shows other συμβόλαια were ἀκούσια. But this is just the division he makes of συναλλάγματα, *ib.* V. v. 13. Amongst the ἐκούσια are πρᾶσις ὡνὴ δανεισμός ἐγγύη χρῆσις παρακαθήκη μίσθωσις: the ἀκούσια are divided into λαθραῖα, *e.g.* κλοπή, and into βίαια, *e.g.* αἰκία. The only difference then would be that συναλλάγματα were the *causae* or sets of facts, while συμβόλαια were the same *causae* clothed with an action. Isocrates opposes the laws περὶ τῶν ἰδίων συμβολαίων to the Laws περὶ τῶν καθ' ἑκάστην τὴν ἡμέραν ἐπιτηδευμάτων, *Paneg.* 56 c.

Now in neither Plato, nor Ar., nor Is., is there any mention of allies or foreigners. Therefore συμβόλαια obtained between equals or natural-born subjects.

The passage in Th. 77, therefore means, *You may call us litigious: why? Because we make the allies bring their civil actions in Athens; but if we do, we give them our own remedies—our own lex fori. If we dealt with them in their own places, and as we might, a very short shrift is all we need give them.* It seems more natural to limit the Comity of Athens to cases between Colonials and Athenians.

133.

¶

Τότε δὲ οἱ ἔφοροι, δείξαντος αὐτοῦ τὰ γράμματα, μᾶλλον μὲν ἐπίστευσαν, αὐτήκοοι δὲ βουλευθέντες ἔτι γενέσθαι αὐτοῦ Πανσανίου τι λέγοντος, ἀπὸ παρασκευῆς τοῦ ἀνθρώπου ἐπὶ Ταίναρον ἰκέτου οἰχομένου, καὶ σκηνησαμένου διπλὴν διαφράγματι καλύβην, ἐς ἣν τῶν τε ἐφόρων ἐντός τινος ἔκρυψε, καὶ Πανσανίου ὡς αὐτὸν ἐλθόντος καὶ ἐρωτῶντος τὴν πρόφασιν τῆς ἰκετείας, ᾗσθοντο πάντα σαφῶς.

Here we are generally told *τέ* is either *too* or the result of anacoluthon; but surely the indicative and relative clause is more emphatic with *τέ* than without it. One of the chief causes of misunderstanding is first translating, and then making the translation the text of the original.

138, 3.

καὶ ἃ μὲν μετὰ χεῖρας ἔχοι, καὶ ἐξηγήσασθαι οἷός τε· ὧν δὲ ἄπειρος εἴη, κρίναι ἱκανῶς οὐκ ἀπῆλλακτο.

'*Whatever he had in hand,*' J., rightly. μετὰ, c. acc., in close proximity to; next after. The other way, *he could explain what he was experienced in*, is faint praise. He did not make a mystery or surprise out of what he was doing.

II.

37, 2.

οὐδὲ ἀζημίους μὲν λυπηρὰς δὲ τῇ ὄψει ἀχθηδόνας προστιθέμενοι,

looks which, though harmless, are not pleasant.—J.

Mr. Tyrrell's explanation is more refined : we are polite for politeness' sake ; not boorish, like Spartans, because we have no legal penalties for boorishness. Our code is

leges a sanguine ductae.

II. 42. 4.

τὸ μὲν αἰσχροὺν τοῦ λόγου ἔφυγον, τὸ δ' ἔργον τῷ σώματι ὑπέμειναν, καὶ δι' ἐλαχίστου καιροῦ τύχης ἅμα ἀκμῇ τῆς δόξης μᾶλλον ἢ τοῦ δέους ἀπηλλάγησαν.

'In an instant, at the height of their fortune, they passed away from the scene, not of their fear but of their glory.'
—J.'s text.

'While for a moment they were in the hands of fortune, at the height, not of terror but of glory, they passed away.'
—J.'s foot note.

I must differ on this passage both from Dr. Jowett and Mr. Tyrrell, and construe thus : δι' ἐλαχίστου καιροῦ τύχης—*Passing through the brief instant of the chance of war*: cf. χρόνον καιρὸν, S. *Electr.* 1292. ἅμα ἀκμῇ τῆς δόξης μᾶλλον ἢ τοῦ δέους—in the height of, what was their glory rather than their apprehension, they passed away :

So amidst the battle's thunder,
Shot and steel, and scorching flame,
In the glory of his manhood
Passed the spirit of the Graeme.

The whole passage may be rendered—

Longing for vengeance on the foe more than aught besides, and deeming too that such was the most glorious

of risks, they resolved to have at that price revenge on their enemies, but till then to postpone enjoyment and make over to the hopeful spirit the haziness of success to come; but as men of action, feeling bound to make sure of that confronting them, and in the very act of self-defence preferring, aye death to coward safety, they kept clear of that which is of words—dishonour—while that which is of deeds they took upon their bodies; and in the quick crisis of the chance, when will, not fear, was at its height, they passed away.

In 48, ἐς τὴν βασιλῆως γῆν τὴν πολλήν is defended against Cobet by ὁ πολὺς ἀπολείπειν ἤδη βίωτος. ὁ πολὺς βίωτος is γὰρ my long life, but the larger part of my life. Electra is speaking: S. *Electr.* 185-6. The Greek of this is not the new Attic, but the older, of which Tragedy is the type.

102. 4.

τό τε γὰρ ῥεῦμά ἐστι μέγα καὶ πολὺ καὶ θολερὸν, αἱ τε νῆσοι πυκναὶ, καὶ ἀλλήλαις τῆς προσχώσεως τῷ μὴ σκεδάννυσθαι σύνδεσμοι γίνονται, παρὰ τὰς καὶ οὐ κατὰ στοῖχον κείμεναι, οὐδ' ἔχουσαι εὐθείας διόδους τοῦ ὕδατος ἐς τὸ πέλαγος.

Serve to connect the deposits made by the river, not allowing them to dissolve in the water.—J. The construction τῷ μὴ σκεδ: sc. τὴν πρόσχωσιν is rightly explained in the note as instrumental dative. Badham's τοῦ μὴ is tautology; if the islands were σύνδεσμοι, the effect must be τοῦ μὴ σκεδάννυσθαι.

[MR. TYRRELL has communicated the following on Book II.:—

II. 11.

Dr. Jowett seems to prefer to construe ἐν τοῖς ὄμμασι πάσχοντας. Such an expression is, surely, impossible;

whereas ἐν τοῖς ὄμμασιν ὁρᾶν (the alternative construction which he seems to depreciate) is excellent Greek, Soph. *Tr.* 241, 746; *Ant.* 764.

29. ἐπὶ πλείον τῆς ἄλλης Θράκης, 'over a great part of Thrace' [but not the whole]. But this would have been τὸ πλείον, cp. ch. 36, τὰ δὲ πλείω αὐτῆς; nor can these last words mean, as J. explains, 'that which goes beyond it'; they must mean 'the greater part of it.'

37. I think I have rightly explained ἀζημίους in HERMATHENA, vol. ii. No. 3, p. 107; ἀζημίους means (as always in classical Greek) 'unpunished,' not 'harmless'; and the sentence may be paraphrased 'we do not wear those sour looks, which, *though there is no fine imposed on them, constitute a moral assault.*' There is not much force in the reading of J.: 'We do not put on sour looks at him, which, though harmless, are unpleasant.'

41. παίδευσιν. 'I say that Athens is the *school* of Hellas.'—J. Hardly possible; the sentence means, 'I aver that (the contemplation of) the whole of the political life of Athens is a *liberal education* for the rest of Hellas.'

47. οὔτε γὰρ ἰατροὶ ἤρκουν τὸ πρῶτον θεραπεύοντες ἀγνοίᾳ. 'For a while physicians, in ignorance of the nature of the disease, sought to apply remedies; but it was in vain.'—J. But it does not clearly appear that medical skill was really able to grapple effectually with the disease *at any stage* of it. This is fatal to all the explanations of this passage which I have seen. I suggest: 'physicians were of no use, as they were treating the disease for the first time, and were, therefore, quite in the dark.'

48. κατέβη ἐς τὴν βασιλέως γῆν τὴν πολλήν. 'Over the greater part of the Persian empire.' But the words as they stand ought to mean 'the vast territory of the King of Persia.' By all means read with Cobet τῆς βασιλείως γῆς τὴν πολλήν, cp. ch. 56, τῆς γῆς τὴν πολλήν.

49. σπασμὸν ἐνδιδοῦσα ἰσχυρὸν, τοῖς μὲν μετὰ ταῦτα λωφή-

·σαντα, τοῖς δὲ καὶ πολλῶ ὕστερον. Surely λωφήσαντα agrees with σπασμὸν, not with ταῦτα, which latter construction does not appear to strike Dr. Jowett as strange; it is perhaps defensible to some extent by δι' ὑμᾶς μὴ ξυμμαχήσαντας, vi. 80, but Dr. Jowett does not seem to think the construction needs defence.

50. οὔτε ἄλλως οὔτε περὶ τοιοῦτον οὐδέν. 'Either about the dead bodies or anywhere else'; but ἄλλως could not mean 'elsewhere'; tr. 'no birds of prey were visible, either engaged in preying on the corpses, or (engaged) in any other way.'

53. τῷ δόξαντι καλῶ, 'the law of honour'—J.: this would be τῷ δοκοῦντι καλῶ; it means 'his own ideal.'

62. ὃ μοι δοκεῖτε οὐτ' αὐτοὶ πώποτε ἐνθυμηθῆναι ὑπάρχον ὑμῖν μεγέθους περὶ ἐς τὴν ἀρχήν. Professor Jebb, in *Hellenica*, neatly gives the true meaning of these words, 'an advantage which the *scale of your empire* confers on you.' Dr. Jowett's version, 'though it nearly touches your imperial greatness,' seems hardly to be found in the words.

65. ὧν μὲν περὶ τὰ οἰκεῖα ἕκαστος ἤλγει ἀμβλύτεροι ἤδη ὄντες. 'Their private sorrows were beginning to be less acutely felt.'—J. In the notes ὧν is explained as a genitive after ἀμβλύτεροι; but there is no other example of ἀμβλύς with a genitive. In defence of this construction J. quotes χαλεπῶς φέρειν αὐτῶν, ii. 62, where the genitive depends on ἐστερημένοι, understood and i. 77, where it depends on στερισκόμενοι expressed; in iii. 11, the genitive after χαλεπώτερον . . . οἴσειν is plainly absolute. I would take ὧν as governed by πέρι, and οἰκεῖα as the accusative of specification, just like τὰ περὶ τὴν πόλιν (= τὰ πολιτικά) ἐταράχθησαν in the same chapter. The sentence in full would have run:—ἀμβλύτεροι ἤδη ὄντες [περὶ τούτων] περὶ ὧν ἕκαστος τὰ οἰκεῖα [ἀλγήματα] ἤλγει.

76. ἀνέκλων. 'Drew them up.'—J. Could Dr. Jowett have read ἀνεῖλκον? He does not mention such a reading, nor have I found that it is suggested anywhere.

R. Y. TYRRELL.]

III. 84.

Ἐν δ' οὖν τῇ Κερκύρα τὰ πολλὰ αὐτῶν προετολμήθη, καὶ ὅποσα ὕβρει μὲν ἀρχόμενοι τὸ πλεόν ἢ σωφροσύνη ὑπὸ τῶν τὴν τιμωρίαν παρασχόντων οἱ ἀνταμυνόμενοι δράσειαν, πενίας δὲ τῆς εἰωθυίας ἀπαλλαξέοντές τινες, μάλιστα δ' ἂν διὰ πάθους ἐπιθυμοῦντες τὰ τῶν πέλας ἔχειν, παρὰ δίκην γινώσκουσιν, οἳ τε μὴ ἐπὶ πλεονεξία ἀπὸ ἴσου δὲ μάλιστα ἐπιόντες, ἀπαιδευσίᾳ ὀργῆς πλείστον ἐκφερόμενοι, ὥμῳ καὶ ἀπαραιτήτως ἐπέλθοιεν. ξυνταραχθέντος τε τοῦ βίου ἐς τὸν καιρὸν τοῦτον τῇ πόλει, καὶ τῶν νόμων κρατήσασα ἡ ἀνθρωπεῖα φύσις, εἰωθυῖα καὶ παρὰ τοὺς νόμους ἀδικεῖν, ἀσμένῃ ἐδήλωσεν ἀκρατῆς μὲν ὀργῆς οὕσα, κρείσσω δὲ τοῦ δικαίου, πολεμία δὲ τοῦ προὔχοντος· οὐ γὰρ ἂν τοῦ τε ὁσίου τὸ τιμωρεῖσθαι προὔτιθεσαν τοῦ τε μὴ ἀδικεῖν τὸ κερδαίνειν, ἐν ᾧ μὴ βλάπτουσιν ἰσχὺν εἶχε τὸ φθονεῖν.

Dr. Jowett defends the authenticity of this chapter; but waiving all the difficulties as to the Greek, its logic appears at variance with the two preceding. Their drift is, '*revolution ended in distrust: all confidence between man and man was gone.*' The gist of 84 is that ἡ ἀνθρωπεῖα φύσις is habitually a law-breaker, which would account for any political change, past, present, or future. In fact, here ἡ ἀν. φ. appears to be taken in the Christian sense of man's depraved nature—*scelerata pulpa*; whereas Th. elsewhere, e.g. 45, 7, uses it scientifically, i.e. the facts and tendencies of man considered as a factor, without any ethical implication; and the sentence οὐ γὰρ ἂν τοῦ τε ὁσίου, κ.τ.λ., is 'goody-goody.' Dr. Jowett says, in his note, of the scholiast: 'it is unlikely he preserved any tradition.' But the scholiast, whom we are glad to see Dr. Jowett does not revile, distinctly says, τὰ ὠβελισμένα οὐδένι τῶν ἐξηγητῶν

ἔδοξε Θουκυδίδου εἶναι, and ἔδοξε is surely past. Dr. Jowett says the interpolation of a long paragraph is without a parallel; which may be true, but some things only occur once. He says no motive can be imagined. I think the fact was, that a Christian wrote it, to bring in Original Sin, wishing either to correct or to complete Th. If he lived in some centre, say Constantinople, its circulation would be easy, and it then might get inserted, perhaps, by authority, in all the copies which issued from that place.

T. MAGUIRE.

[*To be continued.*]

MISCELLANEA.

I.

PLAT. PHAED. 62 A :—

οὐδέποτε τυγχάνει τῷ ἀνθρώπῳ, ὥσπερ καὶ τὰλλα, ἔστιν ὅτε καὶ οἷς βέλτιον τεθνάναι ἢ ζῆν.

I propose to insert *δν* after *βέλτιον*. So Cobet reads *καλὸν δν* for *καλὸν* in Thuc. ii. 35.

Of course *τυγχάνω* without a participle is by no means unexampled in Plato; indeed, it is common enough. But in a passage so obscure as the present, we can hardly suppose that Plato would have been insensible to the greater clearness gained by the employment of it.

64 A :—

βούλομαι τὸν λόγον ἀποδοῦναι ὥς μοι φαίνεται ἀνὴρ τῷ ὄντι ἐν φιλοσοφίᾳ διατρίψας τὸν βίον θαρρεῖν, μέλλων ἀποθανεῖσθαι.

I propose ὥς μοι φαίνεται ἀνὴρ θαρρεῖν μέλλων, μέλλων ἀποθανεῖσθαι, that is, ‘I should wish to set forth to you how it is that, in my judgment, the man who has spent his life as a true philosopher *is sure* to be of good courage, when about to die.’ *φαίνεται θαρρεῖν* would mean ‘wears a deceptive air of confidence’; a present participle is absolutely required to follow *φαίνεται*. This present participle is *μέλλων*, which fell out before the succeeding *μέλλων*. The Greeks were not averse, as we are, to the repetition of

the same word in a different sense or regimen. As an instance of this I would refer to another passage in this dialogue:—οἰκτρὸν ἂν εἴη τὸ πάθος εἰ . . . διὰ τὸ παραγίγνεσθαι τοιοῦτοις λόγοις τοῖς αὐτοῖς τοτὲ μὲν δοκοῦσιν ἀληθῆσιν εἶναι, τοτὲ δὲ μὴ, μὴ ἑαυτὸν τις αἰτιῶτο . . . ἀλλὰ, κ. τ. λ. 90 D. No English writer would think of bringing into juxtaposition two identical words so different in their relation to the rest of the sentence, as the *μὴ, μὴ* in this clause; but the Greeks were not sensitive about such matters.

I accordingly pass now to another case of a similar repetition, where (as I suppose) one of two almost identical words in close juxtaposition dropped out through the inadvertence or the misapprehension of the copyists.

87 B:—

ἐμοὶ γὰρ δοκεῖ ὁμοίως λέγεσθαι ταῦτα, ὥσπερ ἂν τις περὶ ἀνθρώπου ὑφάντου πρεσβύτου ἀποθανόντος λέγοι τοῦτον τὸν λόγον, ὅτι οὐκ ἀπόλῳεν ὁ ἄνθρωπος, ἀλλ' ἔστι που ἴσως, τεκμήριον δὲ παρέχεται θοιμάτιον, ὃ ἡμπείχετο αὐτὸς ὑφηνάμενος, ὅτι ἔστι σῶν καὶ οὐκ ἀπόλῳεν, καὶ εἰ τις ἀπιστῶν αὐτῷ, ἀνερωτῶη, πότερον πολυχρονιώτερόν ἐστι τὸ γένος ἀνθρώπου ἢ ἱματίου ἐν χρεῖα τε ὄντος καὶ φορουμένου.

Of course the subject of ἀνερωτῶη is the supposed propounder of the illustration, and the *τις*, which agrees with ἀπιστῶν, is the other interlocutor, to whom he propounds the illustration. 'It is just as if A should put forward [such and such an illustration], and, on B's doubting his conclusion, should further ask him,' &c. This of course would require ἀπιστοίη, which accordingly Heindorf reads. But how did the easy and regular ἀπιστοίη give place to the inexplicable ἀπιστῶν. Some edd. think that *τις ἀπιστῶν* is put for *τινὸς ἀπιστοῦντος*, which is quite impossible; nor can the sentence be explained by the theory of any mixture of two possible constructions. Fusions of two constructions are common in Plato; but none are found in Plato, or elsewhere, at all affording a parallel to this passage. I

propose to apply again the principle defended in the foregoing note, and read—

καὶ εἰ τις ἀπιστῶν αὐτῷ ἐρωτῇ, ἀνερωτῇ πότερον, κ.τ.λ.,

‘it is just as if A should put forward [such and such an illustration], and (if B, distrusting his conclusion, *should put a question to him*), *should in return put this question to him,*’ &c.

68 C:—

τεκμήριον τοῦτο ἀνδρὸς ὃν ἂν ἴδῃς ἀγανακτοῦντα.

This is a common idiom, not only in Attic, but even in Hdt., ἀνδραγαθίη αὕτη δὲ πολλοὺς ἀποδείξῃ παῖδας, i. e. ‘the procreation of a numerous offspring’ (i. 146). But the idiom is by no means so common in Latin, and has puzzled the commentators on Plaut. *Men.* v. 6. 1–4 (966–969). The passage is:—

spectamen bono servo id est qui rem erilem
procurat videt collocat cogitatque
ut absente ero rem sui eri diligenter
tutetur quam si ipse adsit aut rectius.

The meaning is, ‘it is a proof of honesty in a slave to mind, watch, and arrange his master’s interests, and take thought that he guard them in his master’s absence as well as if he were present, or even better.’ Wagner and others take it, ‘it is a proof of a good slave, who watches his master’s interests, that he should guardian them as well in his absence.’ But, not to dwell on other objections to the construction, *cogitat* could not be explained if divorced from *ut*.

72 B:—

εἰ τὸ καταδαρθάνειν μὲν εἴη, τὸ δ’ ἀνεγείρεσθαι μὴ ἀνταποδιδόη
γγινόμενον ἐκ τοῦ καθεύδοντος.

‘ἐκ τοῦ καθεύδοντος, *ex eo quod dormiat*, dictum est per

variationem quandam orationis pro ἐκ τοῦ καθεύδειν' (Stallb.) This is not a satisfactory explanation: perhaps we should read ἐκ τοῦ καθεύδειν ὄντος, i. e. '*which also exists*,' ὄντος corresponding to and balancing εἴη after καταδαρθάνειν.

74 E:—

οὐκοῦν ὁμολογοῦμεν, ὅταν τις τι ἰδὼν ἐννοήσῃ, ὅτι βούλεται μὲν τοῦτο, ὃ νῦν ἐγὼ ὁρῶ, [εἶναι] ὅλον ἄλλο τι τῶν ὄντων, ἐνδεῖ δὲ καὶ οὐ δύναται τοιοῦτον εἶναι ὅλον ἑκείνο, ἀλλ' ἐστὶν φαυλότερον, ἀναγκαῖον που τὸν τοῦτο ἐννοοῦντα τυχεῖν προειδῶτα ἑκείνο, ᾧ φησιν αὐτὸ προσεοικέναι μὲν, ἐνδεεστέρως δὲ ἔχειν;

I am persuaded that the εἶναι after ὁρῶ should be transposed, and placed before ἀναγκαῖον. The sentence may then be rendered thus:—‘Do we not then allow, that when anyone in observing an object has this conception about it, that it—say the thing I am now looking at, just like any other phenomenon—aims at being such as is the abstract idea, but falls short of it, and cannot come up to it, but is inferior to it [do we not allow], that it seems to follow that the observer who has this conception must have had a prior knowledge of the abstract thing which he says the concrete object resembles, while it falls short of it?’ The usual reading does not give any meaning relevant to the argument; and εἶναι has to be supplied with ἀναγκαῖον after all. τῶν ὄντων = ‘phenomena,’ not ‘self-existing things.’

87 D:—

ἀλλὰ γὰρ ἂν φαίη ἐκάστην τῶν ψυχῶν πολλὰ σώματα κατατρίβειν ἄλλως τε καὶ εἰ πολλὰ ἔτη βιώῃ.

‘He would hold that each soul would wear out many bodies, *especially* if it lived many years.’ ἄλλως τε καὶ is a conjecture; καὶ εἰ and εἰ καὶ and κἂν being the traditions

*

of the MSS. Now εἰ καὶ gives a very much better sense than ἄλλως τε καὶ. Make the supplied subject of βιώη, not ψυχή, but σώματα, and translate 'he would allow that each soul would wear out many bodies, no matter how exceptionally long-lived *the bodies* with which it was associated should happen to be'; lit. 'even though the bodies (associated with it) should be very long-lived.'

110 D:—

καὶ τοὺς λίθους ἔχειν ἀνὰ τὸν αὐτὸν λόγον τὴν τε λειότητα καὶ τὴν διαφάνειαν καὶ τὰ χρώματα καλλίω· ὧν καὶ τὰ ἐνθάδε λιθίδια εἶναι ταῦτα τὰ ἀγαπώμενα μόρια σάρδιά τε καὶ ἰάσπιδας καὶ σμαράγδους καὶ πάντα τὰ τοιαῦτα.

'And fairer in colour than our highly-valued sardonyxes and jaspers, and emeralds, and other gems, which are but minute fragments of them' (Jowett). But it is very strange to describe our earthly precious stones as '*minute fragments*' of gems of the supernal world, between which and our sphere there is no connexion nor communication. It appears to me that for μόρια we should read μορρίας, 'agates'; the sentence would then run:—'and their stones are proportionately more beauteous in smoothness and transparency and colour; and among them are all our highly-prized jewels, *agates*, and sardonyxes,' &c. All our jewels are found there in the same profusion as common stones here.

II.

EUR. *Bacch.* 406 :—

Πάφον θ' ἄν ἐκατόστομοι.

'The MS. reading Πάφον θ' ἄν appears to present insuperable difficulties' (Mr. J. E. Sandys *ad loc.*). Of my conjecture, Πάφον θ', ἄν θ', he justly observes, 'But it may be fairly asked whether in such a case we can understand ἄν as equivalent to τήν τε γῆν ἦν, though the harshness of the ellipse is undoubtedly softened to a certain extent by the further alteration of ἄνομβροι to ἄνομβρον.' It seems to me that the harshness of the ellipse is almost paralleled in Eur. *Tro.* 825 :—

ἀ δέ σε γειναμένα πυρὶ δάεται,

'the land that bare thee is burning with fire.' It is true that the MSS. here add *Τροία* after *γειναμένα*, but this is universally expunged as a gloss, and is proved by the antistrophe to be corrupt.

EUR. *Bacch.* 787 :—

The change of *πείθει* to *πέσει* is, I think, unnecessary, and therefore wrong. But the ellipse of *κακῶς* before *πέσει* is more than paralleled in Eur. *Tro.* 71 :—

κούδεν γ' Ἀχαιῶν ἔπαθεν οὐδ' ἦκου' ὕπο.

Cf. also THUC. vi. 78 :—εἰ. τέ τις φθονεῖ μὲν ἢ καὶ φοβεῖται (ἀμφοτέρω γὰρ τὰδε πάσχει τὰ μείζω), where *πάσχει* means 'is exposed to,' not 'is influenced by,' as one would expect.

III.

I here add a few remarks on Thuc. vi. In Dr. Maguire's paper I have made some comments on Thuc. ii.

7 :—

τῆς τε γῆς ἔτεμον οὐ πολλήν.

It seems necessary to read οὐ τὴν πολλήν (see note on ii. 48 in Dr. Maguire's paper). The expression seems unnatural, but τῆς γῆς ἔτεμον τὴν πολλήν was so habitual that Thuc. here modifies the phrase to express 'they ravaged a part of the country—the country to some extent.'

18 :—

οὐκ ἔστιν ἡμῖν ταμיעύεσθαι ἐς ὅσον βουλόμεθα ἄρχειν,

and in the same chapter—

ἵνα Πελοποννησίων στορεσώμεν τὸ φρονήμα.

Of these expressions the Schol. says that they are κατὰ Ἀλκιβιάδην; they are dramatic specimens of his *boldness* of metaphor; of the latter, Schol. says that this is the boldest, σκληρότατον, of the metaphors in Thuc. Hence we must not translate 'humble the pride,' as Dr. Jowett does; we must indicate a strong metaphor. But what is the metaphor which so struck the Scholiast by its boldness? It may be merely to 'lay low,' 'quell,' as in Eur. *Heracl.* 702 :—

λῆμα μὲν οὖπω στόρννσι χρόνος
τὸ σόν, ἀλλ' ἤβᾱ· σῶμα δὲ φροῦδον.

But is it not more likely that the writer had in his mind the ἀνθρακίην στορέσας of Homer, *Il.* ix. 213? These words describe the putting out of a fire by scattering the embers.

The words of Thuc. would then mean 'that we may *stamp out* their pride'; if, as I suppose, the English phrase 'to stamp out' contains a metaphor from the extinction of a fire by scattering the embers with the feet.

ταμινέσθαι might be rendered 'to play the prudent housewife with.' We cannot act like the prudent housewife, and reduce the scale of our expenditure at pleasure, and again increase it: no, we must keep up our empire at its present high level, or else run the risk of losing it altogether. Strabo, no doubt in imitation of this passage, has ἐταμίενον καὶ κατεκερμάτιζον τοὺς ἀγῶνας (4, 4, 2).

40 :—

ἡγησάμενοι τοῦτο μὲν ἂν καὶ ἴσον καὶ πλεόν οἱ ἀγαθοὶ ὑμῶν ἥπερ τὸ τῆς πόλεως πλῆθος μετασχεῖν,

'remember that the good among you will have an equal or larger share in the government than the people.' (J.) Such is clearly the meaning of the sentence; but is not τὸ πλῆθος τῆς πόλεως a very unnatural expression for 'the people'? τὸ πλῆθος fully expresses the notion, without τῆς πόλεως added. I propose to read ἥπερ τὸ πλῆθος, τῆς πόλεως μετασχεῖν. Then the sense of the above rendering is precisely conveyed, and we get rid of μετασχεῖν with accus., for μετασχεῖν then would not govern τοῦτο, but πόλεως; τοῦτο μὲν means 'on the one hand,' or 'in the first place,' and answers to εἰ δ' ἄλλα βουλήσεσθε in the next sentence; ἴσον and πλεόν are 'to an equal extent' and 'in a greater degree.' The construction of μετέχειν with the accus. is made well-nigh intolerable in this passage by the fact that ἴσον and πλεόν follow.

IV.

The following suggestions are offered to those who may use Mr. Shuckburgh's *Selections from Ovid*:

Selection III., verse 16:—

Et suberat flavae iam nova barba comae,

“‘a new beard of yellow down,’ *flavae comae*, the genitive of the material” (Shuckburgh). *Comae*, ‘hair of the head,’ could not refer to the hair of the beard. Translate: ‘And beneath their yellow locks began to appear the sprouting beard.’

Sel. IV. 6:—

Magna fides avium est,

‘great confidence is felt in augury’ (Shuckburgh). This would be an unnatural, half sceptical utterance in the mouth of Romulus. The meaning is: ‘There is great sooth in birds,’ *i. e.* ‘augury never leads us astray.’

Sel. VI. 25:—

Brutus adest; tandemque animo sua nomina fallit.

The whole point of the verse is that *Brutus* means *dull*, *stupid*. There is a similar play on the name *Brutus* in Cic. *Att.* vi. 1. 25. This point is missed by Mr. Shuckburgh, who writes ‘Ovid has before called Brutus *stulti sapiens imitator*. He is said to have feigned madness to escape the jealousy of the Tarquins.’

Sel. XIII. 7:—

Retia . . . maculis distincta,

‘with its wide meshes’ (Shuckburgh). *Distincta* refers to the *regularity* of the reticulations; it is merely an *epitheton*.

ornans, lit. 'picked out with meshes'; like *lyra gemmis distincta*, Ov. *M.* xi. 167. 'Wide' is not in the word.

Sel. xx. 15, 16:—

Omnia cum subeant, vincis tamen omnia, coniunx;
Et plus in nostro pectore parte tenes.

Plus parte, 'more than half' (Shuckburgh). But *parte* unqualified could no more mean 'a half' than a tenth part, a fiftieth part, or any other fraction of the whole. *Plus parte* is 'more than a part,' i. e. 'the whole.' 'It is not merely a part of my mind that you occupy, but the whole.'

V.

It is certainly true, as Mr. Martley points out in his paper in this number, that *ostium*, *ianua* and *fores* are used indiscriminately. But I do not think the three passages to which he refers, where surprise is expressed that the door is *occlusa*, admit of the interpretation which he puts forward. *Occlusa* in Plautus simply means 'shut,' and can it be supposed that in these three passages, and in these only, it should bear the very different and very definite signification of 'padlocked on the outside'? Was the vocabulary of Pl. so small, or his metre so *exigant*, that he could not describe a condition of the door, so unusual, and so loudly calling for description? He could have written:—

sed quid hoc? occlusa ianuast extrinsecus.

Or, if it be objected that *extrinsecus* does not occur in Pl., it would be easy to suggest other words as suitable. In these passages surprise is expressed that the door is not open by day. I think, therefore, that Ussing is justified in his inference, *ianuae interdium apertae esse solebant*. But if

this be so, we must suppose that there was an outer door, usually left open, and an inner door invariably shut, and that both these doors were indiscriminately called *ostium ianua* and *fores*. Where *crepuerunt fores*, *crepuit ostium*, *pultabo ianuam* are found, the reference is to an inner door, which was kept shut, but in the passages referred to above, *ianua*, *fores* refer to an outer door which was usually kept open by day. This would seem at first sight a confusing use of words. But we must remember that there could be no confusion for the spectators, whose eyes would help their ears.

PL. *Mil.* 100 :—

is amabat meretricem *acre* Athenis Atticis.

In confirmation of *acre* in this passage Prof. Davies has communicated to me that *acre* is found used adverbially in Apuleius, a great student and admirer of Plautus. The passage is Met. 10, 32, *et nunc mite coniventibus nunc acre comminantibus oculis*. As the language of Apuleius teems with expressions borrowed from Plautus, among the rest *Athenae Atticae*, adopted perhaps from this very verse, it seems to me highly probable that he read *acre* in this passage. We find, moreover, in the *Metamorphoses* of Apuleius such Plautinisms as *inter sacrum et saxum*, *ex-amussim*, and even *enim* as first word in its clause. And all these (including *Athenae Atticae*, Met. I. 18) are found, not as quotations from Plautus, but as part of the natural vocabulary of the author.

ROBERT Y. TYRRELL.

REMARKS AND SUGGESTIONS ON PLAUTUS.

‘FORES,’ ‘JANUA,’ ‘OSTIUM,’ IN PLAUTUS.

A GREAT deal of misapprehension seems to exist on the subject of Roman doors. It is only lately that the phrases *crepuerunt fores*, *crepuit ostium* have been correctly explained as referring to the creaking of the wooden hinges on which the doors were hung. Again, an attempt has been made to show that the *fores* are distinct from the *janua* or *ostium*, the latter words being taken to mean the street door, while the former is interpreted as an inner door opening on a passage. A careful examination of the passages in which the words occur will show that this supposition is without foundation.

Stichus, 308.

Quid hoc ? occlusam *januam* video ; ibo et pultabo *foris*.

Truc. ii. 1. 41-2.

Sed *foris* quidquid futurumst feriam.
Ecquis huic tutelam *januae* gerit ?

Most. ii. 2. 14-15.

Sed quid hoc ? occlusa *janua* est interdus ?
Pultabo. Heus, ecquis istas aperit mihi *foris* ?

So also *Amph.* iv. 1. 10-12, *Most.* v. 1. 5.

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These, and many other passages which might be quoted, show clearly that in Plautus's time the *fores* and the *janua* were identical. The evidence from other sources points in the same direction. The following passages will suffice to show this:—

fores in liminibus profanarum aedium *januae* nominantur.

—CIC. *N. D.* 2. 27. 67.

[maritus] *januam* pulsat, saxo *fores* verberat.

—APUL. *Met.* 9. 20.

It has also been asserted that the *janua* of the Roman house was always kept open, while the *fores* were shut. This statement is not borne out by the facts. It is quite certain and undisputed that the *fores* were usually kept shut. The frequency of such phrases as *concrepuerunt fores*, *occludere fores*, &c., places this beyond doubt. When we come to examine the evidence in the case of the *janua* or *ostium* the case is however very different. It is true that in three passages in Plautus surprise is expressed by persons at finding the *janua* shut (*Amph.* iv. 1. 10, *Most.* ii. 2. 14, *Stich.* ii. 1. 36). In these instances the *janua* was probably not only shut, but locked on the outside with a *clavis Laconica*, or padlock, as we know to have been the case in the *Most.* It is to be remarked that the same word *occludere*, which is used for locking the door in the *Most.*, occurs in all these three passages. A man would very naturally be surprised to find his house locked and apparently deserted on his return home. At any rate, these three passages cannot be set off against the multitude of those which speak of the *janua* or *ostium* as shut, while no expression of surprise at their being so occurs. I append some of these:—

Ecquis hoc aperit ostium, . . . *Amph.* iv. 1. 12.

occlude januam, . . . *Aul.* 1. 2. 11.

ostium aperi, . . . *Aul.* ii. 6. 1.

pandite atque aperite januam,	<i>Bacch.</i> iii. 1. 1.
aperitur ostium,	<i>Capt.</i> i. 1. 40.
	<i>Menaech.</i> i. 1. 32.
	<i>Cas.</i> iv. 1. 21.
crepuit ostium,	<i>Cas.</i> iv. 3. 20. <i>Pseud.</i> i. 1. 130.
concrepuit ostium,	<i>Menaech.</i> iii. 2. 57.
pultabo januam,	<i>Poen.</i> iii. 4. 30.

These passages, amongst many others, show that Ussing is wrong when in his note on *Amph.* iv. 1. 10, he speaks thus:—‘januae interdiu apertae esse solebant.’ In fact the evidence goes the other way. Besides the passage from Apuleius, quoted above, we find the following instances in other authors:—

Amatque Janua limen, Quae prius multum faciles movebat
Cardines.—*HOR. Carm.* i. 25. 3.

Non vereor ne Janua frangatur.—*HOR. S.* i. 2. 128.

Quam tu non poteris duro reserare cothurno
Haec est blanditiis janua laxa meis.
—*OV. Amor.* iii. 1. 45–6.

Ferreus orantem nequicquam janitor audis,
Roboribus duris janua fulta riget.
—*OV. Amor.* i. 6. 27.

Janua vel domina penitus crudelior ipsa
Quid mihi tam duris clausa taces foribus.
—*PROP.* i. 16. 17.

Claustra pandite januae.—*CATULL.* 61. 76.

Some of these passages might seem to support an opposite inference, and to prove that the doors were usually kept open, but it is to be observed that what is complained of is, not the fact of the door being shut, but rather its refusal to open.

I have proved, I think, that the *fores* and the *janua* were not distinct doors. Rather, the *fores* were the two

folding pieces of which the *janua* was composed. I have also clearly shown that the *janua* or *ostium* was as a rule kept shut, and not open, as Ussing supposes, misled by three passages in Plautus, which, as we have seen, admit of another explanation.

Curculio, 189.

Pal. Etiam dispertimini ?

Plan. nulli est homini perpetuum bonum.

On the word *dispertimini* Ussing remarks: 'creticus vocem terminans pro trochaeo poni vix potest.' Müller's frigid *disjungimini* will satisfy very few. Possibly we should read *etiam expergiscimini*. A few lines before, Palinurus had remonstrated with Phaedromus for talking with Planesium so late at night, and had said, *Quin tu is dormitum ?* to which Phaedromus had replied: *Dormio ; ne occlamites*, meaning that his conversation with Planesium was as good as sleep to him. Palinurus now takes up the joke and says: 'Are you never going to wake up out of this sleep of yours?' a jesting reminder that it is time for the lovers to part. By this suggestion a very characteristic joke is assigned to Palinurus, who throughout the play never misses a chance of raising a laugh.

Curculio, 299. .

Recte hic monstrat si imperare possit.

This can hardly mean, as Lambinus supposed: 'This man is right to give orders, if he has the authority to issue them.' In fact, if closely examined, the line as it stands will be found to make nonsense. Fleckeisen has suggested

se imperare poscit, leaving *recte hic monstrat* unexplained. The correction is easy. Read—

Recte HÆC monstrat si impetrare possit,

and sense is restored to the passage—‘He is right to proclaim all this, if he can get it carried out.’

Stichus, 357.

Nisi forte hospites venturi sunt.

Pi. lectos sternite.

A syllable is wanting to this line. Fleckeisen inserts *vos* before *lectos*. It should rather be placed after it. The two words ending in the same letters, *vos* was accidentally omitted.

Epidicus, i. 2. 46.

Ego istuc accedam periculum potius †atque audaciam.

Ussing cleverly suggests *potius quam te deseram*. Perhaps, keeping more closely to the MSS., we should read, *potius quam argentum haud agam*.

Epidicus, i. 2. 60.

Adeundum senem oppugnare certum est consilium mihi.

Adeundum is the reading of the *Ambrosianus*. Ussing reads *ad fundum*—an easy emendation, but not very satisfactory. Perhaps we should read: *adeundust senex*; *eum oppugnare*, &c. *Adire* is just the word that Plautus would have used, and is very unlikely to be corrupt in this passage. The shortening of the last syllable in *senex* will offend no one acquainted with the laws of Plautine Prosody.

Poenulus, v. 5. 34-5.

Mastruga, halagoras hama, tum autem plenior
 Alli ulpicique quam *Romani* remiges.

This is, I think, the only passage in Plautus where the word *Romanus* occurs. Plautus invariably uses *barbarus* as a substitute for it. Thus we have *more barbaro*, *poeta barbarus*, *Barbaria* meaning respectively, 'after the Roman fashion, a Roman poet, Italy.'

The word *Romani* then in this passage may be dismissed as a gloss, which has crept into the text, and ousted the genuine reading, *barbari*. The line originally read: *Alli ulpicique barbari quam remiges*.

Truculentus, *Prol.* 10.

Athenis tracto ita ut hoc est proscaenium.

Spengel's suggestion, *Athenis haec sunt*, gives very good sense, but he fails to explain the corrupt *tracto* of the MSS. Probably the line ran somewhat as follows: *Athenis rest transacta: ibi est proscaenium*.

The repetition of the word *transigere*, in the following line, is quite in the manner of the Plautine Prologues.

Truculentus, 1. 2. 90.

verum esse insciti credimus †neuiasuiamurira.

The obelized portion of the line is thus given in A. B and C give *ne uti nestu mutuamur ira*.

Mutuamur is evidently the ignorant attempt of a copyist to set the line right. A comparison of these MSS. with A leaves little doubt on my mind that the true reading was: *verum esse insciti credimus, neque aestuamus ira*.

This is certainly nearer the MSS., as well as better sense, than Spengel's suggestion, *ne eas incendamus ira*.

Truculentus, v. 34.

Meosne ante oculos ego illam patiar alios amplexarier ?
Mortuom hercle *me odio* satiust.

Spengel reads the passage thus, explaining *odio* as equivalent to *ira*. This is not a Plautine use of the word. In Plautus it always means 'tiresomeness,' 'offensiveness': *mihi odio es* = 'you are boring me.' But Spengel is, in my opinion, wrong. The MSS. give *medio*. I propose to read: *mortuom hercle me INEDIA satiust*. The letters *ine* were, by a mistake extremely common in cursive MSS., changed to *me*. This was considered to be a dittography of the preceding *me*, and was accordingly omitted. Hence arose the corrupt reading of the MSS., *medio*. *Inedia* is a Plautine word. It occurs in *Curc.* ii. 3. 30. With this reading the second foot of the line is a dactyl.

W. G. MARTLEY.

NOTES ON LATIN LEXICOGRAPHY.

I.

ON THE PROSODY OF SOME LATIN WORDS.

1. **A**DJECTIVES in *-icius*, *-itius*.—In Lewis and Short's Latin Dictionary, which, as the latest, might be expected to be most free from error, there is an extraordinary confusion with respect to the quantities of the antepenult in adjectives of this kind. Thus, *natalicius* (*-itius*) is four times marked *īcius* (*ītius*), though amongst the authorities for the word are quoted Juv. xi. 84 :

Et natalicium cognatis ponere ludum ;

Pers. i. 16 :

Et natalicia tandem cum sardonyche albus ;

and Mart. vii. 86, 1 :

Ad natalicias dapes vocabar.

Sponsalicius and *venalicius*, though we seem to have no metrical examples of them, must plainly follow the analogy of *natalicius* ; they are both made long in L. and S. *Aedilicius* is also made long ; I suppose on the authority of Plaut. *Capt.* iv. 2, 43. But no good edition has the line in a form which would give the word that quantity. *Praetoricius* is made *-īcius*, in spite of Mart. viii. 33, 1. :

De praetoricia folium mihi, Paule, corona.

And *pastoricius*, which must follow the same rule, is also made *-īcius*. *Latericius*, again, is—without doubt wrongly—made to have the antepenult long.

On the other hand, in relation to the special set of words in *-icius*, which are formed from the past participles of verbs, and of which *emissicius* (Plaut. *Aul.* i. 1, 2) may serve as the type, L. and S. are strangely inconsistent. Thus, whilst rightly marking *congesticius* and *conducticius*, they mark *compacticius*, *commendaticius*, and *commenticius*.¹

Caesicius, which appears to be = *caesio-icius*, has its antepenult long in Plaut. *Epid.* ii. 2, 48 :

Tunicam rallam, tunicam spissam, linteolum caesicium.

But L. and S., though they refer to this line, mark the word *-icius*.

2. *Alicula*.—L. and S. refer under *ālicula* to Mart. xii. 81. But it is *ālicula* (or *hālicula*) that is found there ; and the assumed derivation from *āla* seems to be the only reason for making the word *ālicula*.

3. *Amiculum*.—So Roby (*Lat. Gram.*, § 862) marks this word, whilst connecting it, as we plainly must, with *amīcio*. Is this merely an error of the press ?

4. *Cerinum*.—In Plaut. *Epid.* ii. 2, 51, we read :

Cumatile aut plumatile, cerinum aut melinum. Gerrae maxumae !

On *cumatile*, see below. The metre requires *cērīnum*, if the reading be correct. But the word is commonly explained as = Gr. *κρίνον*, and meaning 'a wax-coloured garment' ; and this would imply *cērīnum*. And, accordingly, L. and S. mark it so. There is a word *carinarius*, which occurs in Plaut. *Aul.* iii. 5, 36. It is explained by L. and S. as 'he who colours wax-colour, a dyer of yellow,' and is

¹ See Roby on words with term. *-icius*, § 930.

With respect to the words *caementicius*, *tribunicus*, which Roby marks *-icius*, and L. and S. *-icius*, there may—in the absence of authority—be some doubt whether the latter be not right ;

for here we have stems in *o*, as in the case of *novicius* (= *novo-icius*). I observe that Roby omits the authority for *conventicius* in Plaut. *Cist.* i. 1, 42, perhaps because the reading there is doubtful.

derived by them from *καρός* = *κηρός*. It would thus naturally mean 'the person who dealt in *κήρινα*', and we should expect its first two syllables to have the same quantity, viz., *cārīnarius*. But L. and S. make it *cārīnarius*. This, however, will not suit the line of Plautus :

Flammeárii, violárii, carinárii.

Indeed, this line implies *cārīnarii*. Lambinus introduced the reading *cerīnarii* for the vulg. *carīnarii*; and perhaps he is right. The truth seems to be, that the word is closely related to *cerinum* in *Epid.*; that we do not know the origin of the latter, and that it does not appear to be related to *κηρός*.

5. *Cumātīlis* [sic] is given in L. and S.; but *cymātīlis* also appears in its place, with a reference to *cumatilis*. The *a* is short, the word coming from Gr. *κυμᾶτ-*; *plumatile*, joined with it in Plaut. *Epid.* ii. 2, 51, has the *a* long, however the latter part of the line may be viewed (v. *cerinum* and *melinum*) :

Cúmatile aut plumátile, cerinum aut melinum. Gerrae máxumae.

The whole line is treated as spurious in the new edition of Ritschl, apparently only because it is so difficult.

6. *Dapīno*.—The case of this word is remarkable. Curtius, recognizing the affinity of *δείπ-νον* (for *δειπ-ινον-ν*, *δαπ-ινον-ν*) with Lat. *dap-s*, cites *dapinare*, which implies *dapīnum*, as illustrating the formation of the Greek word. But the Latin word ought surely to be *dāpīno*, not *dāpīno*. In Pl. *Capt.* iv. 2, 117, however, we have, as Fleckeisen scans the line,

Aéternum tibi dāpīnabo víctum si vera aútumas.

L. and S. mark the word *dāpīno*; and this implies the scansion, seemingly less natural :

Aéternum tibí dap.,

which is that given in Sonnenschein's edition. Ussing passes over the point without notice.

7. *Defrutum* is short (frü) in Virg. *Georg.* iv. 269 :

Defruta, vel psithia passos de vite racemos.

But L. and S., and, I believe, the other Dictionaries, do not observe that it is long in Plaut. *Pseud.* ii. 4, 51 :

Múrrinam passúm defrutum mélinam mel quoiquoímodi.

(I quote from Ritschl's and Fleckeisen's text ; the variations in other editions do not affect the point now adverted to). Hence Curtius cannot be said to be wrong when twice in his *Grundzüge*, pp. 586, 520 (4th ed.), he writes *defrútum*.

8. *Feritribax* is found in Plaut. *Most.* ii. 1, 9) :

Úbi sunt isti plágipatidae, férritribacés viri.

As the text stands, it must have the penult long (trī) ; and it is so marked by L. and S. ; but Ramsay in loc. makes it short. See Mr. Tyrrell in *HERMATHENA*, vol. II. p. 115.

9. *Fōculum*.—I pointed out in the first No. of *HERMATHENA* the confusion between the cases of this word and those of *fōculus* into which some writers had fallen. L. and S. have not escaped this error ; they quote as examples of *foculus* Plaut. *Capt.* iv. 2, 68 :

Láridum atque epulás foveri fōculis fervéntibus,
and *Pers.* i. 3, 24 :

At edés : nam iam intus véntris fumant fōcula.

Lindemann in the former of these passages introduced *in* before *fervéntibus*, wrongly, as I believe, though Fleckeisen follows him ; but L. and S. do not adopt this change of text.

10. *Gryps*, *gryphis*.—The gen. is marked *grýphis* in L. and S. ; but this is at variance with their citation from Virg. *E.* 8, 27 :

Iungentur iam grypes equis.

Claudian and Sidonius, too, whom they quote as using the word, make the *y* long.

11. *Habiturio*.—This desiderative, which is probably rightly read in Plaut. *Truc.* i. 2, 48 (54, Weise), is made long (-ūrio) by L. and S., contrary to the universal rule.

12. *Homerionidae*.—This is made *Homerōnidae* in L. and S. But the *o* is long in Plaut. *Truc.* ii. 6, 4, the only place where the word occurs (if even there it is genuine):

Ēt Homerionidae ēt postilla mīlle memorārī potest.

13. *Indusium*, *indusio*, *indusiarius*, are made long (in-dūsium, etc.) in L. and S. But wrongly: in Plaut. *Aul.* iii. 5, 35:

Ciniflōnes, patagiārii, indusiārii;

and in *Epid.* ii. 2, 47,

Īndusiatam, pátagiatam, cáltulam aut crocótulam,

the *u* is plainly short.

14. *Melinum*.—In Plaut. *Epid.* ii. 2, 51, quoted under *Cerinum*, the word certainly seems to be *mēlinum*. But we are told by L. and S., following (I believe) most of the authorities, that it is really *mēlinum*, = μήλινον, 'a quince-yellow garment,' from μῆλον. How that account can be reconciled with the metre, I do not see. It is possible, however, that *melinum* is not the right word in the place at all; see the new ed. of Ritschl.

[L. and S. by some oversight quote *Epid.* i. 1, 20, in which *mēlina*, quite a different word from the above, occurs, not only under *mēlina* ('a purse of marten's skin'), but also under *mēlina* ('mead'), which has nothing to do with the line cited.]

There is a different *mēlinum* from the above, which L. and S. mark *mēlinum*, and for which they refer to Plaut. *Most.* i. 3, 106; but that line is, in all the MSS.,

Néque cerussam, néque melinum, néque aliam ullam offúciam,

which would give *melinum*. Ritschl, however, has—perhaps rashly—changed *neque melinum* to *melinumve*, doubtless taking the word to be *mēlinum*, formed from the local name *Melos*.

15. *Prosodiacus*.—L. and S. mark the word *prosodiacus*, adding ‘= προσδιακός.’ But the Greek word is, without doubt, *προσοδιακός*, and the second syllable of the Latin word is short.

16. *Somniculosus, somniculose*.—The *i* is made short by L. and S.; it is really long, as the passages they cite show. Thus, Mart. iii. 58, 36 :

Somniculosos ille porrigit glires.

In Plaut. *Am.* ii. 1, 75,

Nōn soleo ego somnículose eri imperia persequi,

the latter part of the line may, perhaps, give rise to some difficulty, and Fleckeisen inserts *mei* after *eri*; but this does not affect the quantity of *somniculose*. *Capt.* ii. 1, 33,

Tanta íncepta rés est: hau sómniculóse hoc,

is a Bacchiac line, and the *i* in *somniculose* is plainly long.

Febriculosus (Cat.) and *siticulosus* (Hor.) follow the same analogy. The accurate Roby, whilst giving these, adds *meticulosus*, which L. and S. mark as having the *i* short. The metrical passages to which they, in common with other lexicographers, refer, are decisive for *ī*; Plaut. *Am.* i. 1, 137:

Nállust hoc metículosus aéque. S. Em, in mentém venit.

And *Most.* v. 1, 52 :

Néscis quam metículosa rés sit ire ad ítúdicem.

The *tu* which in some texts appears after *nescis*, Camerarius inserted, as Ritschl says, ‘errans de *meticulosa* vocis prosodia.’

17. *Trochaicus*.—This word L. and S. mark *trochæicus*; but anyone who has read Bentley's note on Hor. *Epl.* i. 5, 1, knows that the word is *trochæicus*; cf. Ἀχαιικός from Ἀχαιοί. Bentley quotes from *Ter. Maur.* the decisive line :

Érgo qui versús paratur ínteger trocháicus.

Indeed L. and S. refer to the same author, p. 2437 P., where we read :

Nam sicut ille redditur trochaicus.

But they have not drawn the obvious conclusion.

J. K. INGRAM.

ADOPTION: A STUDY IN COMPARATIVE JURISPRUDENCE.

‘The son adopted is the reflection of a son begotten.’—SAUNAKA.

‘Ut haec simulata adoptio filii quam maxime veritatem illam suscipiendorum liberorum imitata esse videatur.’—PRO DOMO AD PONTIFICES.

‘Adoptio naturam imitatur.’—JUSTINIAN.

THE systems of archaic jurisprudence in which Adoption is a really prominent feature are Roman Law and Hindu Law. Both belong to the Aryan family of mankind. In neither of the Semitic legal systems do we find any trace of adoption. The Jews did not practise it, nor do the Mahomedans. I do not mean that no Jew or Mahomedan ever adopted a child; but that their customs and their codes of law made no systematic provision for their doing so. On the other hand, adoption is found in races which are neither Aryan nor Semitic; but in these instances the races are under Aryan influence. All over India there are numerous communities which are classed under the common name of Hindu, but are very far from being of pure Aryan blood. The polytheism and nature worship of the early Aryans, while on the one hand evolving the pantheistic and idealist philosophies of Buddhism and modern Brahmanism, on the other lent themselves largely to popular superstitions.

All these had a common element in ancestor worship, and of that worship we accordingly find traces wherever we find adoption part of the legal system of an Indian tribe. The Roman law of adoption was largely influenced

by ancestor worship (*sacra gentis*), though in its Christian form under Justinian this element naturally disappeared. The Brahmanical law assumes ancestor worship all through. Where Brahmanical Hinduism and what I may call aboriginal Hinduism touch, the worship of ancestors comes in either as the basis of the law of adoption, or as a decoration of the superstructure. The non-Aryan Hindus were, and are, always aiming at being considered true Hindus; and, whenever they could, they sought to connect their law with Brahmanical law. They were not always successful, and there was often a conflict of interest. One branch of a family would profit by the assumption that family affairs were governed by the Brahmanical law; the interest of another would be to prove that they were governed wholly by local family custom. It is to be noted that this attempt of non-Aryans to identify themselves with Aryans was, on the whole, discouraged by the Brahmans. If ancestor worship had not prevailed among the aboriginal tribes (as we know from independent authority that it did) those tribes would not have had any excuse for assimilating their family law, and especially their law of adoption, to Brahman law. We may therefore infer that the Brahman accepted the ancestor worship of the despised Sudras and non-Aryan castes generally, because he found it already in vogue among them. It is certainly not true that he forced it on them.

With reference to the law of Adoption, then, it may be said—(1) that whatever its real utilitarian reason may have been, historically it is identified with ancestor worship; (2) that it disappeared from the known Semitic legal systems, because ancestor worship had become obsolete before those systems were framed; (3) that the typical examples of it are Aryan, in Roman and Hindu law; (4) that where it is found in non-Aryan races it is systematised under Aryan influence.

It is well worthy of a passing notice, that the Greeks do not seem to have practised adoption very extensively. The usage is indeed referred to in Demosthenes and Isaeus; but it never played so important a part in Greek life as it did in Roman life. The Greeks, for one thing, had not the passion for systematising their law which actuated the Romans. Whatever their legal usages may have been, we were sure to know less of them than we do of their Roman analogues. Still, I venture to think we may safely conjecture that here we have another indication of the relation of adoption to the worship of ancestors. The direct worship of ancestors survived longer among the Romans than among the Greeks. Adoption is infinitely more prominent in Roman than in Grecian history and literature. These facts point very strongly to the connexion I am suggesting, and may fairly be adduced as corroborative evidence.

Of course I am not taking the law of Rome as formulated by the Christian Emperor Justinian, and striving to invent analogies between it and the other system of archaic Aryan law. But it is very remarkable that, in like manner as Justinian tells us that adoption follows nature, so the Hindu jurists lay down that the adopted son is 'the reflection of a son.' I assume all through, what I have to say here, that the law laid down in the Imperial law books was mainly a declaration of that which they found in force already. Of course Justinian was not likely to lay down any dictum which postulated the truth of heathenism, but in all other respects he would declare the law rather than innovate on it. The custom itself of adoption we know Justinian did not invent; he found it in force and he regulated it.

That the system of Roman adoptive law presented strong analogies to the Brahmanical system is a point which some jurists have seen; but I am not aware that any-

one has attempted to follow out the analogy minutely. It is extremely unfortunate that the most elaborate legal argument on the law of adoption in the Roman Republic—the oration *Pro Domo Sua ad Pontifices*, commonly attributed to Cicero—is of very doubtful authenticity. If it were certainly Ciceronian, no one could doubt that the Roman law laid down in it was at least a plausible argument from the point of view of a Roman conservative jurist. But even treating it as non-Ciceronian (though composed not long after Cicero's time), it may fairly be adduced as evidence of what a Roman literary and legal archaeologist would pronounce to have been a possible argument in Cicero's mouth. As such, the passage is eminently worthy of being extracted. Cicero, or his imitator, says—*Quod est, pontifices, jus adoptionis? nempe ut is adoptet qui neque procreare jam liberos possit, et, quum potuerit, sit expers.*

Here we have a very close approach to the Hindu law, in force from prehistoric time to the present day. A childless married man is precisely the person who, in Hindu law, not only *may* but *ought to* adopt a son. *Quae deinde cuique causa sit adoptionis, quae ratio generum ac dignitatis, quae sacrorum, quaeri a pontificum collegio solet.* We shall see the full bearing of this presently, but, meantime, compare it with Vasishta's ceremonial of an adoption:—*He who means to adopt a son must assemble his kinsmen, give humble notice to the King, and then, having made an oblation to fire with words from the Veda in the midst of his dwellinghouse, he may receive as his son by adoption a boy nearly allied to him, or, on failure of such, even one remotely allied.* Considering who the Roman Pontifices were, each of these passages very remarkably fits in with the partly sacerdotal and partly legal and political ritual of the other. Again, *adoptat annos viginti natus, etiam minor, senatorem.* There is no positive precept of Hindu law which says that the adopting father must be old enough to have been the

natural father of the adopted son, but the whole Hindu ritual of adoption is carried out in the spirit of the Latin passage I have just quoted, and the more definite one, lower down—*quod eae vestrae sint aetates ut is qui te adoptavit loco patris, vel filii tibi loco per aetatem esse potuerit, vel eo quo fuit.*

These words breathe the very spirit of the text of Saunakā, which declares that an adopted son is the 'reflection' of a son begotten. Turning back for a moment, in the *Pro Domo*, we have—*Quid? sacra Clodiae gentis cur intereunt, quod in te est?* There was not the smallest danger of the *sacra Clodiae gentis* becoming extinct, but the taunt was not without meaning. In order to realize its full meaning we must look to Hindu law. An only son, or an eldest son, must not be transferred to another family, lest his natural ancestors should lose the family sacrifices, and his natural father suffer spiritually thereby. *The father of an only son*, says Nanda the Pandit, *may not give him to be adopted by another.* And Jaggan Natha the Pandit says, *Let no man accept an only son in adoption lest the family of the natural father become extinct.* For similar reasons the transfer by adoption of an eldest son was looked upon as illegal. Saunaka and Vasishta, as well as the other authorities quoted, both denounce it.

But remarkably enough there is one exception, and it is one for which the Ciceronian rhetorician provides something like a parallel. We have seen already that by Hindu law the adopted child must be near of kin to the adopter, if any such can be found (Vasishta, *supra*). Saunaka is more definite still, for he declares that, at least among Brahmans, the adopted son must be chosen among the near *sapindas*, i. e., those who, in the funeral rites and in the rites of ancestor worship, are entitled to join in offering the *pinda* or consecrated cake. What says the author of *Pro Domo Sua*? After citing prece-

dents, he says, *Quas adoptiones, sicut alias innumerabiles, hereditates nominis, pecuniae, sacrorum secutae sunt. Tu neque Fonteius es, qui esse debebas ; neque patris heres ; neque, amissis sacris paternis, in haec adoptiva venisti.* Clodius was not a Fonteius, so his name does not run in the line of adoption. A Hindu Pandit would say, Clodius was not *sapinda* to Fonteius ; he did not even belong to the *gens*. On the other hand, if Fonteius (supposing him to be a childless Hindu) wanted to adopt a son, he might have chosen his own brother's eldest or even only son. Why ? Because the family *sacra* would have been in no danger. But to go out of his family, and choose one who was not a *sapinda* (to speak after the manner of Hindus) was a complete invalidation so long as there were any *sapindas*. If Fonteius and Clodius be supposed to be Hindus, indeed, the whole hypothesis of a possible adoption vanishes at once. For Clodius was a patrician and Fonteius a plebeian ; they belonged to different *castes* ; and to adopt out of one caste into another (still worse, from a higher into a lower) is unheard of in Hinduism.

But in the Roman case, the transfer of Clodius from the patrician caste (so to speak) to the plebeian caste was the very end and aim of the whole transaction. Clodius wanted to be Tribune of the Plebs. He did not care about the few aristocratic privileges which were still attached to the patrician caste. The case was one which could not possibly have arisen in Hindu society, which was, and is, in a stage even more archaic than that of society under the Roman Republic. Yet even here we may detect a sort of parallel.

Suppose that Cicero had really been author of the speech *Pro Domo Sua*, and that Clodius had been called on to answer his argument, his obvious course would have been to demur, in the first place, to Cicero's exposition of the law, which naturally was onesided. But, in addition

to this, he might have said, 'Concede, for argument's sake, that you are correct in your view of the law of Adoption. This act which you are assailing was not an Adoption; it was an Adrogation. It was not the act of two private families, one anxious to provide for the continuance of the race and the sacrifices; the other willing, it may be, to make the fortune of a superfluous child. Your taunt about the extinction of my *gens* and its *sacra* is irrelevant, for there are plenty of Clodii to keep up the race and the observances of its ancestry. True, I am not a Fonteius, and I shall inherit nothing from Manius Fonteius, even if I survive him. I am fifteen years his senior, and yet I bound myself, during the few hours that elapsed until he emancipated me, to pay honour to him as to my own father. I do not belong to his *gens*, nor even to his order in the State, and that is precisely the reason why he was chosen as my nominal father. This act which you are assailing is an act of the State; an act, not of P. Clodius and M'. Fonteius, but of the Roman People in Comitia Curiata. Do you claim to annul the act of the sovereign people of Rome by your pettifogging quibbles about age, and paternity, and gentile kinship? The reason why I am here as the adopted son of a plebeian, who in the order of nature might be my son, is that the Roman People chose to qualify me to become Tribune of the Plebs; and beyond the constitutionally recorded decree of the Roman People you cannot go.'

Some such reply as this Clodius might have made; and in all probability it would have been held conclusive. We do not know how far an ordinary *adrogatio* was subject to the same rules as an *adoptio*, properly so called. Justinian treats them alike; but his authority is of no avail when the question is one concerning Republican usage. Aulus Gellius refers to the subject, but does not tell us much about it, beyond giving the form of the *rogatio*, and

laying down the rule that the *adrogatus* must be of age (*vesticeps*).

From the point of view of comparative jurisprudence the most remarkable feature of the case is, that just as in the Clodian *adrogatio*, so among Hindus, when an adoption is an act of State, the Sovereign power often takes on itself to overrule all ordinary considerations of law. A Prince in Rajputana, or other Hindu native states, from time to time adopts a man older than himself—a distant, in preference to a near, kinsman—an eldest or an only son—and even a relative so ineligible as a sister's son. For in this case as in others, it is held expedient to 'imitate nature,' and, since a brother cannot marry a sister, to prohibit him from adopting her son—*Ut haec simulata adoptio filii quam maxime veritatem illam suscipiendorum liberorum imitata esse videatur*. The rule of Hindu law which prohibits adoptions within forbidden degrees does not appear in Roman law, probably because it was never thought necessary to formulate the prohibition. But like the other rules, which I have shown to be common to the law of the Hindus and the law of the Roman Republic, it is constantly overridden in practice by the will of the Sovereign or the counsel of his advisers. The one thing the Hindu Prince never does is to adopt out of his own caste. Of course neither does the Hindu subject. In the subject's case there is no temptation, and in the case of a Sovereign Prince it is the one matter about which he dare not yield to temptation.

This marks the difference in the stage of evolution reached by Rome and by even modern Hindu society. Ages before Clodius, the boundaries of caste had been broken down by the *Lex Canuleia*, which abrogated the old exclusive laws of marriage. Even in Clodius's case it never suggested that the difference of caste is a bar to the *adrogatio*. But with this sole and unavoidable excep-

tion, the author of the *Pro Domo* makes every point he possibly could make; and it is a very remarkable and interesting fact that every one of them is a point of Hindu law. The practice of the Roman constitution set aside every one of these points, and so does the Hindu Sovereign whenever he sees fit.

E. S. ROBERTSON.

POSTGATE'S SELECTIONS FROM PROPERTIUS.

THIS is a carefully edited book, exhibiting the results of long and close study of the most peculiar, difficult, and corrupt of the Augustan writers. It is, like many of the editions in Messrs. Macmillan's series, marked by high scholarship, and also by a prudent and sober judgment rarely found in an editor's first work. It is to be regretted that Professor Postgate's labours have been, so to speak, thrown away on a small selection.

In criticism, however, I am sorry to find my standpoint is often far removed from that of so able a scholar as Professor Postgate, and the following remarks are chiefly written for the purpose of indicating points where, in my judgment, he has erred in principle. For instance, take the reading of 3. 1. 27 :

Nam quis equo pulsas abiegnō nosceret arces,
Fluminaque Haemonio comminus isse viro,
Idaeum Simoenta Jovis *cum prole Scamandro*,
Hectora ter campos ter maculasse rotas ?

Here N has nothing after *Iovis*. All other MSS. have the words *cunabula parvi* after *Iovis*. No manuscript has *cum prole Scamandro* or anything faintly resembling it. Yet Postgate calls Wolff's conjecture *cum prole Scamandro* a *certain* conjecture. If it is a certain conjecture, farewell—a long farewell—to criticism from me. It was open to Wolff, who believed that N was the only uninterpolated Propertian MS., to hazard a random guess as to how the line might have ended. It is not open to me, nor to Postgate, who recognise other MSS., to reject their unanimous *cunabula parvi* for something out of which *cunabula parvi* could not have grown. Postgate does not yet fully

appreciate the influence of proximity in causing corruption, or else he might well have weighed my conjecture of *Idæo sub monte*. Not only should not the river Scamander be let in, but the river Simois should be turned out as a corruption owing to the proximity of *flumina*. In each of the four lines a different subject is naturally treated, rather than an awkward dilatation of the second into two lines. But whatever Postgate may think of my emendation, I emphatically protest against his calling 'certain' one of the rashest emendations ever made.

Again, on *lyrae*, in 4. 6. 36, 'There is no need to emend *deae*, &c., with Paley.' Well, if there is no need to emend *lyrae* here, there is little need to emend anything. If the presence of *lyrae*, difficult though it be, were unaccounted for, it might stand. But when it is accounted for by the occurrence of *lyrae* four lines before, there is surely every need to change it. I do not expect many to accept my bold emendation, *ferae*, although I believe in it, and think that Propertius had especially *capreae* and *dammae* in his mind—to call which *imbelles* was a poetic commonplace. To those who think that *ferae* cannot be called *imbelles* I will point out Martial 4. 74 :

Aspicias *imbelles* tentent quam fortia dammae
Proelia ? tam *timidis* quanta sit ira *feris*.

That Postgate allows little influence to the important principle of proximity is nowhere more clearly shown than by his retention of *Aquilo* in 2. 5. 4 :

Et nobis Aquilo, Cynthia, ventus erit.

I hold that *alio*, Scaliger's reading, is right, and that even *aliquo* is quite unnecessarily close to *Aquilo*.

I believe that *aliquo* is always 'to some place or other,' and not 'to some other place,' which is the sense of *alio*. Postgate, however, discards even *aliquo*, retaining *Aquilo*.

I feel disappointed by the following remark :—' The fol-

lowing seem to be all the certain instances' (of lengthenings in arsis):

Vinceris aut vincis: haec in amore rota est.

Now I had fondly hoped that I had exploded this reading by writing *Vinceris: at vinces*: the confusion between *at* and *aut*, and between the terminations of the present and future being common in Propertius. My reading also gives the better sense:—'You are *now* conquered, but you *shall* conquer!' There is in this a proper comparison to a wheel. The unhappy lover's good time will come, as surely as the under side of the revolving wheel shall come uppermost. And so Philistion, πάλιν γὰρ ὕψει τῶν κακῶν περιτροπήν· αἰὲν γὰρ ὡς τροχὸς ὁ χρόνος κυλιέται, rightly gives the future ὕψει. But in the ordinary reading, 'you conquer or are conquered,' there is no similarity to a wheel at all. Mr. Postgate, however, lavishes one of his *certain*s on the vulgate, leaving one single pentameter in the whole of Propertius labouring under a metrical defect, when the correction is simple and in accordance with all critical laws.

Of the new readings introduced in this selection the chief are the following:—

I. i. 33.

In me nostra Venus *voces* exercet amaras.

Voces is Mr. Postgate's own conjecture for *noctes*. I regret that I cannot assent to it. *Noctes amarae* is a Latin common-place, and quite in keeping here. To talk of his mistress's shrewish tongue here seems to me out of harmony with the tenor of this beautiful poem. Venus uses bitter nights as her instruments of torture. The main difficulty is the use of *nostra* after *me*, and some epithet of Venus is perhaps right.

I. ix. 31.

Illis et silices et possint cedere quercus :
Nedum tu possis, spiritus iste levis.

'To them (blandishments) both flints and oaks may yield . much more mayest thou, poor, vain breath!' Baehrens here, apparently ignoring the fact that *nedum* means in Latin 'much more' as well as 'much less,' reads *par sis* for *possis*. Postgate adopts this as an 'ingenious' conjecture. It seems to me scarcely worthy of mention, and I cannot understand Postgate's objection to the vulgate.

In I. xx. 52, Postgate returns to the old reading, *tutus* for *visus* :

Formosum Nymphis credere visus Hylan.

He has not, however, made up his mind as to whether it is an adjective or participle; nor, if it be a participle, as to whether it is active or passive. If an adjective, he would render it 'careful about trusting.' Barth rendered it exactly the reverse: 'careless about trusting.' Postgate's explanation is preferable on more grounds than one, but I fear the line is almost hopelessly corrupt.

On I. xxi. 9, Postgate with much confidence reads *quicumque*, and must have been pleased to find his conjecture supported by Baehrens' parvenu MSS. With equal confidence, I uphold *quaecumque* against *quicumque*. The lines are :

Et quaecumque super dispersa invenerit ossa
Montibus Etruscis haec sciat esse mea.

'I cannot believe,' says Postgate, 'that Propertius could have made Gallus say that *all* the bones on the mountains of Perusia were his.' This can be retorted. I cannot believe that Propertius would make Gallus say that

every man that found bones on the mountains of Etruria was to be informed that they were the bones of Gallus. Besides, Postgate's reading deprives the verse of its pathos—the idea of the sister seeking her missing brother, and finding his bones upon the mountain. But not only does it deprive it of pathos, but it makes it comparatively absurd. For if the ordinary stranger (*quicumque*) were told they were the bones of Gallus, he would probably reply he didn't care a nutshell whose bones they were. But the sister, she would care. She would gather the bones with loving hand, and gently lay them on a bier, and bring them to the distant home where she and Gallus had played as children. Then she would build a costly pyre, and with trumpets sounding and mourners wailing, with gifts of gold and incense she would burn her murdered brother's bones, and then collect his ashes in an urn, and dutifully place it in the tomb of their fathers. And when she had done all this, not before, she would rest in peace, because she would only then know that the pale ghost of Gallus was satisfied. And this, a Roman's burial, was what Gallus wanted, when he made his last petition of his flying comrade, no mere vain request that each chance passer-by should know that he had fallen on that Etruscan hill.

II. vii. 6.

Nam citius paterer caput hoc discedere collo,
Quam possem nuptae perdere more faces.

Here Professor Postgate, from N, with Baehrens, though probably independently of him, reads *more* for *amore*. He is probably right, and I regret not having *more* in my edition. Postgate illustrates by Terence's 'alieno more vivendum est,' and says it means at the will and humour of a bride. There is also a reference, I think, in *more* to the

humdrum daily round of matrimony contrasted with *faces*, the consuming fire of unshackled passion :

‘ Love’s a fire that needs renewal
Of fresh beauty for its fuel :
Love’s wing moults when caged and captured :
Only free, he soars enraptured.’

In the same poem Postgate suggests, v. 20, *nomine* for *sanguine*, very plausibly, comparing Lucretius’ Quod patrio princeps donarat nomine regem.

In iv. vii. 22, I am glad to see he feels able to accept Mr. Ellis’s well-known conjecture *Mimantis*. It is certainly, whether true or false, a brilliant emendation.

In iv. vii. 29, he reads the pretty but unnecessary conjecture *curvate*, suggested to me by Mr. W. T. Lendrum, of Trinity College, Dublin, and Caius College, Cambridge, the credit of which conjecture he gives to Mr. Peskett in the first instance. By which of the two it was first published I do not know.

In iv. vii. 46, Postgate reads his own good conjecture *sat est* for the difficult *potest*. It is perhaps too much to say that Propertius could not have written *potest*. He certainly could write very doubtful Latin at times.

In v. ii. 34 :

Faunus plumoso sum deus aucupio.

Postgate reads *Fautor* from C. Roszbach, N giving *Fauor*. This emendation is very scantily defended by Postgate.

For the very vexed passage iv. xi. 39, 40, Postgate reads :

Et Persem proaui stimulantem pectus Achilli
Quique tumens proauro fregit Achille domos.

Following up Heyne’s suggestion that several passages in Silius Italicus were imitated from these lines,

Postgate gives *tumens*, where the MSS. for the most part give *tuas*, and where Heyne proposed *Et tumidas* with *Qui* for *Et* in the preceding verse. Postgate's reading is clever, but unfortunately demands that *Quique* refer to Perseus, which is unnatural, and also gives an unnatural meaning to *fregit domos*, 'proved the ruin of his own house.' I am not convinced that *tumens* or *tumidus* was in the passage as it came before Silius Italicus. I rather imagine that when Silius used such expressions as *proavo-que tumebat Achille* of Philip, although he undoubtedly had this passage before him, he was turning into the common poetic diction of his time the idea contained in Propertius' pregnant ablative. Juvenal has *tumes alto Drusorum stemmate*, and it is not necessary to suppose that Juvenal was here imitating Propertius. I believe the lines as they stand in the MSS. (with *simulantem*) are sound, and that the meaning is: 'I call Perseus to witness, the assumer of the courage of his ancestor Achilles, and him who crashed through thy home, Perseus, in spite of that ancestor, Achilles.' I do not think the repetition of *proavo Achille* would be justifiable except in a different application.

In IV. xi. 70, Postgate reads *facta* for *fata*, and well supports it. I believe, however, that *mea fata* is right. *Mea fata* is Propertian for 'me after death.'

It would be difficult to speak in terms of too high praise of the careful and instructive introduction to this edition. It shows a complete mastery of the difficult subject, which it must have taken long and close study to obtain. It is, in fact, a much-wanted Propertian grammar in itself, and I hope it will one day precede a complete edition of the poems. But of this and the commentary I cannot here write at length, for I have not yet been able to read the latter with the attention it deserves, being somewhat tired of Propertius.

P.S.—Since writing the foregoing I have seen Professor Postgate's remarks on *Propertius* in 1880, in the *Transactions of the Cambridge Philological Society*, vol. i., pp. 372–386. I thank him sincerely for his kind remarks concerning my small edition, and assure him that his gentle censures are well weighed and will in some instances be acted on. I still, however, prefer my interpretation of 3. 9. 38 to his own. As to my giving up my emendation of 3. 6. 22, I would rather burn the whole edition. Giving *domi* for *domo*, I ask Professor Postgate what fault he finds with the emendation? Is it that it is too violent? It is nearer the best MS. than any other reading. Is it the sense? The sense is exactly what is demanded. Is it the Latin? I have exactly illustrated *qualem dicere nolo* from Juvenal and Catullus. I will now illustrate *domi habere* from Q. Cicero *de Pet. Cons.* 2. 8: *quo tamen in magistratu amicam quam domi palam haberet de machinis emit.*

A. PALMER.

SOME NOTES ON THE GREEK COMIC FRAGMENTS.

CRATINUS, *Archilochi*, VII.

Ἦδη δέλφακες, χοῖροι δὲ τοῖσιν ἄλλοις.

Read :

ἦβη μὲν ἦδη δέλφακες, χοῖροι δὲ τοῖσιν ἄλλοις.

‘In point of age full swine, but in all other respects young pigs.’ That the δέλφαξ was older than the χοῖρος appears from the following passages :—Acharnians, 786 : νέα γάρ ἐστιν ἀλλὰ δελφακουμένα, *cet.* *Ibid.* 781 : νῦν γε χοῖρος φαίνεται, ἀτὰρ ἐκτραφεῖς γε, *cet.*

Cleobulinae, III.

Ἔστιν ἄκμων καὶ σφῦρα νεανία εὐτριχι πῶλῳ.

Read :

ἔστον ἄκμων καὶ σφῦρα νεανία εὐτριχε πῶλῳ.

‘A pair of long-maned horses are a hammer and anvil to a young man,’ *i.e.* I suppose, he makes them his entire occupation. Εὐθριξ is only applied to horses in Homer.

Nemesis, IX.

Σπάρτην λέγω γε σπαρτίδα τὴν σπάρτινον.

Read :

σπάρτην λέγω γε τὴν σπυρίδα τὴν σπάρτινον.

πλέγμα τι σπάρτινον is Pollux’s comment. Σπυρις and πλέκος are often joined together, as, for instance, in *Ar. Ach.* 454, 455 :

Δ. δός μοι σπυρίδιον διακεκαυμένον λύχνῳ.

Ε. τί δ’, ὦ τάλας, σε τοῦδ’ ἔχει πλέκους χρέος ;

PHERECRATES, *Epilesmon*, I.

᾽Ωλεν ὀβελίαν σποδεῖν, ἄρτου δὲ μὴ προτιμᾶν.

Read:

ὄλην μὲν ὀβελίαν σποδεῖν, ἄρτου δὲ μὴ προτιμᾶν,

‘To gobble up a whole toasted loaf, but not to care for bread.’

Tyrannis, I.

The poet accuses women of giving men small drinking cups, and using large goblets themselves.

σφίσι δὲ γ’ αὐταῖσιν βαθείας κύλικας ὥσπερ ὀλκάδας
οἶναγωγούς, περιφερείς, λεπτάς, μέσας γαστροῦδας.

Read: μεγίστας, γάστριδας, ‘of immense size, pot-bellied,’ or else, in one word, μεγιστογάστριδας, ‘of enormous paunches.’

Chiron, III.

In a very pretty fragment we find the meanness of a host depicted, who does not wish his guests to stay too long. When a guest thinks of going, and another guest detains him, he becomes irate, and says, ‘speed the parting guest.’

᾽Μηδένα μὴτ’ ἀέκοντα μένειν κατέρυκε παρ’ ἡμῖν
μήθ’ εὐδοντ’ ἐπέγειρε, Σιμωνίδη. οὐ γὰρ ἐπ’ οἶνοις
τοιαυτὶ λέγομεν δειπνίζοντες φίλον ἄνδρα;

ἐπ’ οἶνοις here is manifestly corrupt, and should, I think, be changed to ἐπ’ αἰνοῖς, ‘appealing to proverbs,’ as the host has just done.

HERMIPPUS, *Palladis Ortus*, VI.

ὁ Ζεὺς, δίδωμι παλλάς, ἡσί, τοῦνομα.

The line is rightly emended except in δίδωμι. The Greeks said *θέσθαι ὄνομα*. The MS. of Photius gives *διδωνω*, of Suidas *διδόναι*. Hence it is likely that the line really was—

ὁ Ζεὺς δ' ἰδὼν, ναί, Παλλάς, ἡσί, τοῦνομα.

Dei, I.

Ἐπειθ' ὅταν πινώμεθ' ἢ διψώμεθα
εὐχόμεθα πρὸς τοῦτ' οἶνος, ὦ κέρας, γενοῦ.
κὰς τοῦ καπήλου ἄγ' ἔγω φέρω παίζων ἅμα
καῦθις γεγένηται τοῦτο πέντε καὶ δύο.

This passage has greatly exercised the skill of critics. I think, by reading in the first verse

Ἐπειθ' ὅταν διψῶμεν ἢ πενώμεθα,

a fair sense may be given. Mercury, probably, is speaking. He is talking of the life of the gods and the Horn of Amalthea which supplied their wants. 'In the next place, when we are thirsty, or in want of money, we say, "Horn become wine." And I carry the wine to the retail wine merchant's, joking on the road (and sell it to him), and then there is a further change. The retailer sells it in the shape of five to two,' *i. e.* five parts water to two wine.

ARISTOPHANES, *Babylonii*, VI.

Eustathius, p. 911, 63, has :

καὶ ἱτέας δέ τινας ἀσπίδας Ἀἴλιος Διονύσιος ἱστορεῖ φέρων καὶ χρῆσιν
ἐξ Ἀριστοφάνους ταύτην.

Ἄνῃρ πεδίτης ἱτέαν ἐνημμένος.

Eustathius wrote *τινας πέδας*, 'a sort of fetters.' -ας was repeated owing to dittography.

AMIPSIAS, *Funda*, IV.-V.

Pollux, ix. 96 :

ἐν δὲ τῇ τοῦ Ἀμειψίου Σφενδόνη ὃ τε τρόπος δεδήλωται τῆς κυβείας καὶ προσείρηται ὅτι εἴη τὸ τριμαμνααῖον, ὥς μὲν αὐτῶν ἐπιδιατεθειμένων ἐκάστῳ κύβῳ.

The Greeks played with three dice. Pollux tells us here that they staked a mina on each die. Hence the meaning of the corruption is obvious, although the correction is difficult. Perhaps: ὅτι εἴη τὸ τρίμα τριμνααῖον. The maximum throw was three minae.

Meineke reads τὸ τρίμα μνααῖον from Kühn and Jungermann. But the pips of the dice have nothing whatever to do with the passage.

METAGENES, *Auræ*, I.

Ὑμῖν ὀρχηστρίδας εἶπον ἐταίρας
 ὥραιās πρότερον νῦν δ' οὐχ ὑμῖν ἀγορεύω
 ἄρτι χνοαζούσας αὐλητρίδας αἱ τε τάχιστα
 ἀνδρῶν φορτηγῶν ὑπὸ γούνατα μισθοῦ ἔλυσαν.

So written the passage is nonsense, and Meineke suggests αὐτῷ for οὐχ in v. 2. But by simply putting a question stop at the end perfect sense is given. Ἀγορεύω is regularly used in questions with οὐκ; as Ar. Ach. 41: οὐχ ἡγόρευον; Plut., 102:

οὐχ ἡγόρευον ὅτι παρέξειν πράγματ' ἐμέλλετόν μοι;

ANTIPHANES, *Dyserotes*.

ἐκεῖσε διαπλέω
 ὅθεν διεσπάσθημεν ἐρρῶσθαι λέγων
 ἅπασιν, ἵπποις, σιλφίῳ, συνωρίσιν,
 καυλῷ, κέλησι, μασπέτοις, πυρετοῖς, ὀποῖς.

Some one is speaking here who at Cyrene combined a love for horses with the silphium trade. He bids good-bye here to both. σιλφίῳ, καυλῷ, μασπέτοις, and ὀποῖς are all various forms or parts of silphium; the alternating words are various words for horses. Hence πυρετοῖς is a corruption for some sort of horse, probably πυρροῖς, 'bays.' *Theoc.* 15. 53 :

ὀρθὸς ἀνέστα ὁ πυρρός.

Miles, II.

B. ἐρριπίζετο
 ὑπὸ τῶν περιστερῶν ὑπ' ἄλλου δ' οὐδενός,
 δειπνῶν ὁ βασιλεύς. A. πῶς; ἐάσας τᾶλλα γάρ
 ἐρήσομαί σε τοῦτο· πῶς; B. ἡλείφετο
 ἐκ τῆς Συρίας ἤκοντι τοιούτῳ μύρῳ. κ. τ. λ.

In the third line read :

ἐρήσομαί σε τοῦθ'. B. ὅπως; ἡλείφετο. κ. τ. λ.

MENANDER, XIV.

Θεός ἐστι τοῖς χρηστοῖς αἰεί
ὁ νοῦς γὰρ, ὡς ἔοικεν, οἱ σοφώτατοι.

Bentley connected οἱ σοφώταται to ὁ σοφώτατοι, in which he is followed by Meineke. But I think that οἱ should be οἷ. The lines may have run somehow thus :

ὁ νοῦς γὰρ ὡς ἔοικεν οἷ σοφώτατοι
θεός ἐστι τοῖς χρηστοῖς αἰεί.

‘The mind, as is held by those who are the wisest, is a god to the good.’ Epicurus called the mind God, perhaps others of the σοφοί. A second verse may be completed by the insertion of μέγιστος after θεός, or writing θεὸς θεός τις.

A. PALMER.

THE BUCOLIC CAESURA.

WHAT is the bucolic caesura? The oldest account of it is that the fourth foot ends with the end of a word, so that the verse closes with an Adonic, or dactyl with spondee. But this rule refuses the test of observation. In the first idyll of Theocritus, which is in every respect a true type of bucolic poetry, it is violated twenty-seven times in a poem of one hundred and fifty-two verses, that is, once in about every six lines; and in the eleventh idyll, a poem of eighty-one verses, it is violated twenty-six times, or once in about every three lines. And here let it be at once premised that in dealing with the question of the bucolic caesura, we must not segregate certain idylls, and call them *vere bucolici*, unless they have some other striking characteristic of bucolic poetry beside the caesura. For instance, in *subject* and *dialect*, which are the real tests of a bucolic poem, the eleventh is in the strictest sense bucolic, though it is fatal to the theory of the bucolic caesura held by Marius Victorius and Terentianus Maurus. There are, of course, other idylls, which are plainly exercises in epic poetry, which in both subject and dialect declare themselves to be *not* types of bucolic poetry, and which must not be appealed to in a question about the usage of these poets.

We cannot, therefore, accept the crude account which the ancient grammarians have given of this phenomenon in the style of the Greek bucolic writers, though the rule of Victorius and Terentianus Maurus is still given by modern writers; for instance, by Dr. Bucholz, of Berlin, in his *Anthology of Greek Lyric and Bucolic Poetry*, 1875; and by Professor Fritzsche, of Leipzig, in his edition of *Theocritus*, 1869.

In the most recent editions of Theocritus published in England, the rule has been stated in a more temperate manner, but has not yet been laid down with accuracy. Mr. Snow (Oxford, 1873) says: 'in an average of five lines out of six in the bucolic idylls there is a caesura closing the fourth foot; and whenever this is the case it is a dactyl.' Now this rule, more moderate in so far as it speaks of a tendency, not a law, is yet far too general; and in the words 'the bucolic idylls' the way is opened for the misleading distinction to which I have above referred. In laying down that 'whenever this is the case' (*i. e.* whenever there is a caesura closing the fourth foot), the fourth foot is a dactyl, Mr. Snow is at once met by a number of violations of the supposed rule, to account for which he is first obliged to refuse the title of 'thoroughly bucolic' to all the poems of Theocritus, except the first eleven and the twenty-first; and next is forced to suggest that the eleventh idyll, which violates his canon *six times*, is constructed in violation of the bucolic caesura 'to express want of refinement in the love-song of the Cyclops.'

Bishop Wordsworth is contented with a still more moderate statement of the rule, but even his rule is too broad. He lays down that '*in the truly bucolic idylls*,'¹ whenever the fourth foot is a spondee, and ends a word, the fourth foot must not be a disyllable or hyperdisyllable, and must not end with a monosyllable incapable of beginning a sentence.' In vindication of this canon he proceeds to emend certain verses of Theognis² which conflict with it. Among these verses are the following:—

and ἔστιν ὁ μὲν χείρων, ὁ δ' ἀμείνων ἤματα πάντα,
ἀσπάλαθοί γε τάπησιν ὁμοῖον στρώμα θανόντι.

¹ *i. e.*, I–x., but even in these there are many violations of his rule.

observes this canon, according to the Bishop.

² Theognis, in his elegiac poems,

These are excellent verses, but they conflict with Bishop Wordsworth's canon, and accordingly he corrects them. The correction was easy, suspiciously easy. When a correction is very easy, let the emendator beware of hidden traps. The lines as emended by the Bishop run thus:—

and
 ἔστιν ὁ μὲν χείρων ὁ δὲ ἔργον ἕκαστον ἀμείνων,
 ἀσπάλαβοί γε στῤῥῳμα θανόντι τάπησιν ὁμοῖον.

These are lines which perfectly conform to the Bishop's canon; but unfortunately they could not have been written by any Greek poet from Homer to Nonnus, because they have a rhythmical phenomenon which is not found in Greek hexameter verse. There is no real instance in Greek hexameter verse of a trochaic caesura in the fourth foot. The verse

Πήλεος θῆν μοι ἔπειτα γν | ναῖκα || γα | μέσσεται αὐτὸς,

was corrected by Aristarchus to

Πήλεος θῆν μοι ἔπειτα γυναικά γε μάσσεται αὐτός;

and there is no other verse so constructed in the whole of Greek epic poetry, or even in the Greek Anthology.¹ A verse which apparently violates this canon is Theocr. xviii. 15—

κῆς ἔτος ἐξ ἔτεος, Μενέλαε, τεὰ νυὸς ἄδε.

¹ It is a remarkable circumstance that the doctrine of enclitics and non-initiative words is not fully carried out as regards this metrical usage. An enclitic or non-initiative word should count as part of the word which it follows, just as it does in the rule of the pause; and accordingly such a clausula as

γυναικά τε θήσασο μάζον

is quite legitimate. But the strange circumstance is that the doctrine of the enclitic does not seem to be applied in

violation of a verse otherwise sound; for instance,

λιγὸς περ ἔων ἀγορητής

is right, though, according to the doctrine of the enclitic, *λιγὸς περ* should be regarded as one word. The same is the case with the verse ending *ἔσον τε γέγωνε βοήσας*, which occurs more than once in Homer, and which would of course afford an instance of the trochaic caesura in the fourth foot, were the enclitic regarded as part of the word which it follows.

But this verse has been emended by Ahrens, both in the interests of the metre and the grammar, to

κῆς ἔτος ἐξ ἔτεος, Μενέλα, τεὰ ἄ νυὸς ἄδε.

We have seen that all the statements of the *rule* are too general, and that even the statement of the *tendency* is not sufficiently qualified. What, then, is the bucolic *caesura*? The only expression of the rule (as far as I know), which really colligates the phenomena is that of Dr. Maguire, Fellow of Trinity College, Dublin, and it runs thus:—

‘When the fourth foot ends with a word, the fourth foot must be a dactyl, *if there is a stop after the fourth foot.*’

This is a rule which is in itself reasonable, and which commends itself to those who have observed the nicety of ear for rhythm which distinguished the ancient Greek. It will be found to be true in every case.¹ According to it, a verse like Theocr. xi. 54—

ὦμοι, ὅτ’ οὐκ ἔτεκέν μ’ ἅ μήτηρ βράγχι’ ἔχοντα

is perfectly sound; but Bion, xv. 19,

χιονέαις πόρφυρε παρειῆς, καὶ τὸ βάδισμα

is wrong, and calls for the easy emendation, παρηῖσι for παρειῆς. This rule will be found to be quite universal in the bucolic poets, and does not depend on a distinction between bucolic idylls and truly bucolic idylls, which is often fanciful, and sometimes fallacious. It is not observed in the Homeric hexameter, and seems to be quite peculiar to bucolic verse.

R. Y. TYRRELL.

¹ Dr. Maguire’s rule shows that, in Theocr. i. 6, κρέας should be read for κρήs, and that in xi. 10, we should read

with the best *codices* οὐ μάλοις, οὐδὲ ῥόδοις, οὐδὲ κικίννοισ, for the *vulg.* οὐδὲ ῥόδοις, οὐ μάλοις, οὐδὲ κικίννοισ.

LOGICAL NOTES.

IV.—ON SOME LEGAL MAXIMS MISTAKEN FOR PHILOSOPHICAL.

1. *Exceptio probat regulam.*

THIS maxim furnishes a notable example of the influence of words on thoughts. As it assumes the imposing form of an accepted rule of philosophy, it is supposed that the only question is how to apply it rightly; in other words, to distinguish exceptions which prove the rule from those which disprove it. In fact the maxim is a purely legal one, and is thus fully stated in legal text-books (*e.g.* Wharton's *Law Dictionary*), 'Exceptio probat regulam de casibus non exceptis.' The exact meaning of it, as well as perhaps its earliest statement, is in these words of Cicero, 'Quod si exceptio facit ne liceat ibi necesse est licere ubi non est exceptum' (*pro Balbo*, 14). If, for instance, it were enacted that it should be unlawful to do a certain thing on Sunday, it would follow that it was lawful to do it on other days.

2. *Cessante causa cessat effectus.*

J. S. Mill treats this as an accepted rule of physical inquiry in the olden time, and takes pains to refute it, appealing *ex. gr.* to the case of death from being run through the body. It would be rash to assert that it never was mistaken for a physical maxim; but if so, it is only another example of the influence of words. It was certainly originally and properly a legal maxim, expressed sometimes in other forms, and is given as such in the text-books.

It may be applied, for instance, to the case where a certain power is conferred expressly for a certain purpose: the purpose ceasing, the power ceases.

V.—OF THE EPIMENIDES FALLACY.

This crux is so generally imperfectly stated that it may be worth while to give it in a correct form. It appears to have been invented for the purpose of showing that the principle of contradiction admits of exceptions. It is from this point of view that it possesses interest. It has been stated by no writer better than by Ueberweg, who gives it somewhat as follows:—‘Every statement made by a Cretan is false.’ Call this proposition A, and suppose that it is universally true up to the moment when Epimenides makes a statement which we shall call B. If now this new statement is false, then A remains universally true; but if B is true, A is now false, there being one exception. Now, let $B = A$, and the result is: If B is false it is true, and if true it is false.

Or we may take the reasoning in the inverse order. Supposing that A has hitherto been universally true, if it remains so after Epimenides has added his item to the list, then his statement B must have been false. On the other hand, if A is no longer universally true, then B, which is the only new statement, must have been true. As before, introduce the hypothesis that $B = A$, and we have the result: If A is true it is false; and if false, it is true.

I need scarcely remark, that to object that A is not absolutely universal is utterly futile. We might just as well pretend to solve the ‘crocodile’ puzzle by saying that no crocodile ever made the supposed offer.

The true solution is this. In assuming that $B = A$, we may mean either that $B =$ the already existing A ; or that $B =$ what A becomes after B has been uttered. In the former case, no contradiction arises; in the latter, we covertly assert two distinct propositions. 'All previous statements *and also* the present statement are false.' 'The present statement' is an unmeaning term, and does not admit of either of the predicates 'true' or 'false' until after a proposition has been framed which can be called 'the present statement.' There are, therefore, really two propositions, viz.: 'All previous statements are false,' and 'This statement itself is false.' These are of course contradictory, and the proposition which unites them both is neither true nor false, but unmeaning, because self-contradictory. This will be more clear from the consideration that A is equivalent to a series of propositions contradictory of individual Cretan assertions. It is, therefore, equivalent to 'X is not Y, and M is not Z, and etc.' On the supposition that the proposition itself is included we have 'X is not Y, and M is not Z, etc.; and at the same time X is Y or M is Z, or etc.'

T. K. ABBOTT.

ON THE EFFECT OF THE TIDES ON THE LENGTH OF THE DAY.

§ I.—*Historical.*

IN the year 1754 the Berlin Academy proposed, as the subject for a prize essay, the question ‘Does any cause exist tending to retard the rotation of the earth?’ What the result of the competition was I do not know; but the question led to the publication by Kant of a short essay, in which he suggested that such a retarding cause existed in the tides. He worked out this suggestion in a rough way, there being, as he truly said, no ascertained data on which any trustworthy calculation could be built.

Laplace examined the question from the historical side, with the help of the records of ancient eclipses, and came to the conclusion that the period of rotation—in other words the length of the day—had not altered.

Recently astronomers have seen reason to reopen the question. In particular, M. Delaunay has inferred from the records of ancient eclipses that the day is lengthening at the rate of one second in a hundred thousand years. At first sight this may seem to be an amount too small to leave any trace in history. It must be remembered, however, that in calculating what part of the earth’s surface came into the shadow of a given total eclipse, say 2500 years ago, we have to ‘unwind’ 2500 times 365 (= 91,250,000) rotations, and a difference amounting to a fortieth of a second between the first and last of these would in the whole period have a very considerable effect. M. Delaunay attributes the retardation to the moment of the moon’s disturbing force on the tidal prominences. He

started from the assumptions that without friction it would be high water under the moon and anti-moon, and that friction retards the time of high water. Both these assumptions were erroneous; but they so far counteracted one another as to leave the place of high water in the same quadrants as the true theory, viz., in the quadrants east of the moon and anti-moon, in which the moon's force is retarding.

Sir George Airy corrected these errors, and working out the equations, found two terms which indicate a constant current westward—one term (the smallest) depending on the vertical, and the other on the horizontal displacement of the water.

In my own Essay on the Theory of the Tides (*Quarterly Journal of Mathematics*, 1872, and *Philosophical Magazine*) the effect of friction was indicated, but there was no attempt to estimate it quantitatively. I am not aware that any attempt has been made to solve this problem; and indeed it would be absurd to pretend to do so with any degree of accuracy. What I propose to do is to estimate the effect so far as to enable us to form a judgment as to the actual importance of the tides as a cause retarding the earth's rotation.

It will be convenient first to prove the following proposition respecting the effect of obstacles:—

§ II.—*Obstacles which check the motion of the water towards a certain point retard the time of high water, and increase the height.*

If the obstacle is a complete barrier the tide will rise as long as the motion of the water is *towards* it, and will fall as long as the motion is *from* it. Hence at 45° east of quadratures it will be high water on the east of such an obstacle, and low water on the west of it. The influence

of this on the time of high water at other places will extend as far as the pressure is felt.

An obstacle not sufficient to stop motion altogether will produce a similar effect, but of course much smaller, in consequence of the continuity of the surface. If the obstacle be such as to destroy half the velocity of the water, then high water would be 30° after quadratures. In both cases the height would obviously be increased.

It appears from this that the effect of such obstacles is in both respects the reverse of that of friction.

§ III.—*Effect of the moment of the moon's attraction on the tidal prominences in an equatorial canal with the moon in the equator.*

This is the way in which the retardation was supposed by M. Delaunay to be produced, and Messrs. Tait and Thomson have adopted the same view.

Now, in order to estimate the greatest effect possible, let us suppose that the greatest elevation is in the middle of the quadrant, *i.e.* 45° before quadratures; and further, that the elevation is not diminished by friction.

Let H = the moon's greatest horizontal force.

ω = angle from the moon.

e = greatest elevation.

Then the tangential force at any point = $H \sin 2\omega$, and the elevation = $e \sin 2\omega$. Multiplying by the element of the equator, we get the moment = $He \sin^3 2\omega \times r d\omega \times r$. The constant part of this is = $\frac{1}{2} He r^2 d\omega$.

Summing round the circle, we have for the whole moment $He \pi r^2$.

Taking the density of the earth as = 5, the moment of inertia of the equatorial section of the earth is = $\frac{2}{3} \times 5 \pi r^3$. Dividing the former by the latter, we have for the accelerating force $\frac{3}{2} \frac{He}{5r}$.

$$\text{Now, } H = \frac{3^2}{13 \text{ millions}} \text{ and } e = \frac{\text{depth of sea}}{84,000}.$$

If we assume the depth of the sea to be 3 miles, the accelerating force becomes nearly = $\frac{1}{152 \text{ billions}}$.

Multiplying by the coefficient of friction, and by the number of seconds in 100,000 years (about 3 billions), we obtain $\frac{1}{50} f$ nearly.

Now, the velocity of the earth's surface at the equator is about = 1530. Hence,

$$\frac{1}{50} f = \frac{\text{earth's velocity}}{76,500} f.$$

If the earth's velocity is diminished in this proportion, the length of the day will be increased by

$$\frac{86,400}{76,500} f \text{ seconds} = \text{nearly } 1.13 f \text{ seconds.}$$

Now, in the case supposed f is excessively small, the friction being chiefly that of water on water. Hence we conclude that in an unobstructed equatorial canal the effect of friction in retarding the rotation would be quite insignificant, even on the supposition above adopted, that the place of high water is 45° before quadratures. If this place were affected only by friction, the displacement would really be only a few degrees, if so much. It appears, therefore, that the direct effect of the moon's disturbing force on the tidal prominences is wholly insensible.

It would not amount to one second in a thousand million years.

But there is another way of viewing the matter, which does not introduce f . The following consideration explains this:—

§ IV.—*Of the effect of the residual current westward due to the change in the time of high water.*

The constant force found above = $\frac{1}{2}He$ produces an accumulating westward tendency in the water. This once impressed will continue until destroyed by friction. Therefore when we take a sufficiently long time we may assume that the total moment (of the water) is not diminished by friction—that is to say, on the assumption made above, that the elevation is not affected, and friction being so slight, this may be assumed. Moreover, although friction alone could not accelerate high water so much as three hours ($= 45^\circ$), or anything like it, our conclusion will hold if the displacement takes place from any other cause.

This being premised, I shall now examine the question from the point of view suggested by Airy.

§ V.—*Effect of the changes in the disturbing force due to the displacement of the water.*

By substituting, in the expression for the disturbing force, the altered value of the ordinate of the water for the original value ($x + X$, for x), Airy finds that the expression contains a constant term dependent on the distance of high water from quadrature. The source of this constant term may be understood from the following observation:—

The particles are in their mean place at the moment of high water and at that of low water; at the former they

are travelling west with their greatest velocity; at the latter they are travelling east, also with their greatest velocity. Now, the place of high water being W. of quadrature, and the water moving W., it follows that when the water reaches quadrature, approaching the moon, it is behind, or W. of the place which without friction it would have occupied. On the other hand, at syzygy it is in advance, or E. of its place. In both cases the disturbing force is diminished by this displacement, the force being greater the nearer the particles are to the middle point of the quadrant. In other words, $H \sin 2\omega$ is diminished throughout, ω being increased when over 45° , and diminished when less than 45° . In the following quadrant, *i.e.* after passing the moon, the opposite change takes place, since the particles enter it east of the place they would otherwise have, and leave it W. of their place. Now, the former quadrant is that in which the moon's force is accelerating, the latter that in which it is retarding. The same observation applies to the other two quadrants. Thus the accelerating and retarding forces are no longer in equipoise, the latter predominating.

To calculate the effect:—The maximum excursion of the water without friction in the case of a canal three miles deep would be about 126 feet. Assume that this is undiminished; and assume, as before, that it is high water 45° W. of quadratures. Then we may assume the displacement at each point to be $= 126 \cos 2\omega$; and the moon's force being $= H \sin 2\omega$, the loss (or gain) $= 2H \cos 2\omega \times \frac{126}{r} \cos 2\omega$.

The constant part of this $= H \frac{126}{r}$.

Putting for H its value $\frac{1}{400,000}$, and calculating the effect continued for one lunar day (89,000 seconds, we have

$$\frac{10}{45} \times \frac{126}{r} = \frac{100}{75 \text{ millions}} \text{ nearly.}$$

This acts on the whole mass of the canal. Hence we have as the force for one day

$$\frac{3}{2} \frac{100}{75 \text{ millions}} \times \frac{\text{mass of canal}}{\text{mass of equatorial section of earth}}.$$

With assumed depth of sea, the latter factor = $\frac{1}{3300}$.

$$\text{Hence the daily force} = \frac{1}{500,000} \times \frac{1}{3300}.$$

Multiplying by the lunar days in 100,000 years (about 33 millions), we have as before $\frac{1}{50}$.

For the reason before stated, it is unnecessary to multiply this by the coefficient of friction.

There is a third way of viewing this cause. Owing to the displacement of the place of high water, since that is the point where the water is moving fastest westward, the water is a longer time in the retarding quadrants than in the others, *e.g.*, on the previous hypotheses it is 126 feet behind its place on entering the accelerating quadrant, and 126 feet in advance on leaving it. It is, therefore, in that quadrant about $\frac{252}{1480}$ seconds = about .17 less than a quarter of a lunar day. This would give a similar result to that already found.

The preceding calculations are obviously applicable to the case of a globe uniformly covered with water, since each section parallel to the equator would give the same results. The meridional wave would have no effect on the rotation.

It is not worth while to extend our calculation to the case of the moon not being in the equator. The nett result would be to diminish the retardation.

§ VI.—*Application to the actual state of the earth's surface.*

In attempting to apply the preceding results to the actual condition of things on the earth's surface, the following points must be noted :—

First.—On the earth as it actually is the effect of friction proper is trifling compared with that of obstacles. Against these the tidal current, if any, impinges, and in addition the increased elevation gives the moon an increased pull, which, if acting towards the obstacle, exerts its full moment on the earth, but only for a fraction of a day.

Secondly.—The existence of a retarding influence depends, as we have seen, on the place of high water being in what I have called the retarding quadrants, *i.e.* less than six hours in time later than the moon's meridian passage. If this condition is violated, the influence might be accelerating. Suppose a continent whose coasts run N. and S. (as those of America may be roughly said to do), then if it is high water on the east coast less than six hours after the moon, the effect of the pull just mentioned is retarding; if it is high water on the west coast more than six hours after the moon, the effect is to accelerate. In other cases the direct effect is *nil*.

Now, owing to the great irregularity of distribution of land and water, theory will not help us in determining the times of high water; but on consulting the Tables founded on observation we find, for example, the following results:—

In the open part of the Pacific Ocean high water is about 30° before quadratures; farther from the equator at both sides it is at quadratures; farther still it is 30° after quadratures.

(Confining ourselves to the direct effect of the pull on the tidal prominence.)

The effect on—

East coast of China,	None.
„ India,	„
„ Australia,	„
„ Africa,	Retarding.
„ S. America,	„
„ N. America,	None.
West coast of S. America (Peru), . . .	Accelerating.
„ N. America (California, &c.), . . .	„
„ Australia,	„

(It should be observed, that for the present purpose we ought to take the time of high water where the depth of the sea being ————)

‘ON THE EFFECT OF TIDES ON THE LENGTH OF THE DAY.’

ADDENDUM.

PAGE 353, line 9, after ‘friction,’ *add* ‘This, therefore, would give as the extreme maximum of retardation 1.13 second in 100,000 years. This is curiously close to Delaunay’s result, derived from the history of eclipses, but as it represents an unattainable maximum, the coincidence is of no importance.’

to the entire globe. But in the case of the earth it is not so, and this would still further diminish the retardation.

On the whole, it would appear that no certain conclusion as to the retardation of the earth’s rotation by the tides can be drawn from theoretic considerations.

T. K. ABBOTT.

ON A PROPERTY IN THE THEORY OF THE IRROTATIONAL STRAIN OF AN INCOMPRES- SIBLE LAMINA IN THE PLANE OF ITS MASS.

IN connexion with the above theory the following general property of a particular but extensive case of the strain may be interesting to the reader; viz.—

In the irrotational strain of an incompressible lamina in the plane of its mass; if the equations $r^n \cos n\theta = a^n$ and $r^n \sin n\theta = b^n$, where a and b are parameters, represent in polar co-ordinates the orthogonal line systems of extreme displacement of the molecules, the equations $r^{2n} \cos \frac{1}{2}n\theta = a^{2n}$ and $r^{2n} \sin \frac{1}{2}n\theta = b^{2n}$, where a and b again are parameters, represent in similar co-ordinates the orthogonal line systems of extreme dilatation of the strain.

To prove this property. Since, for every state of such a strain in such a lamina, the equations $u = a$ and $v = b$, where u and v are the conjugate functions corresponding to the strain and where a and b are the parameters, represent in finite terms one the potential and the other the displacement line system of the strain; while the differential equation in rectangular co-ordinates

$$\frac{d^2u}{dx dy} \cdot \frac{dy}{dx} + \frac{d^2u}{dx^2} \pm \left[\left(\frac{d^2u}{dx dy} \right)^2 + \left(\frac{d^2u}{dx^2} \right)^2 \right]^{\frac{1}{2}} = 0,$$

or the corresponding equation in v , according as u or v is the potential and the other consequently the displacement

function of the strain, represents, through the double sign of the involved radical, the two orthogonal line systems of extreme dilatation, positive and negative, of the strain. Hence when, in polar co-ordinates, $u = r^n \cos n\theta$ = potential and $v = r^n \sin n\theta$ = displacement function of the strain; since then, $x = r \cos \theta$ and $y = r \sin \theta$, $dx = \cos \theta dr - r \sin \theta d\theta$ and $dy = \sin \theta dr + r \cos \theta d\theta$,

$$\frac{du}{dx} = \frac{dv}{dy} = nr^{n-1} \cos(n-1)\theta \text{ and } \frac{du}{dy} = -\frac{dv}{dx} = -nr^{n-1} \sin(n-1)\theta,$$

$$\frac{d^2u}{dx^2} = -\frac{d^2u}{dy^2} = \frac{d^2v}{dx dy} = n(n-1)r^{n-2} \cos(n-2)\theta$$

and

$$\frac{d^2u}{dx dy} = \frac{d^2v}{dy^2} = -\frac{d^2v}{dx^2} = -n(n-1)r^{n-2} \sin(n-2)\theta;$$

the differential equation in x and y becomes transformed by substitution, after a few trifling reductions, into the differential equation in r and θ

$$-[\cos(n-1)\theta \pm \cos \theta]dr + [\sin(n-1)\theta \pm \sin \theta]rd\theta = 0,$$

or, taking separately the upper and lower signs which correspond respectively to the two opposite systems of orthogonal lines, into the two equivalent equations

$$\frac{dr}{r} - \frac{\sin \frac{1}{2}n\theta d\theta}{\cos \frac{1}{2}n\theta} = 0 \text{ and } \frac{dr}{r} + \frac{\cos \frac{1}{2}n\theta d\theta}{\sin \frac{1}{2}n\theta} = 0,$$

the complete integrals of which in finite terms are respectively

$$r^{1/n} \cos \frac{1}{2}n\theta = a^{1/n} \text{ and } r^{1/n} \sin \frac{1}{2}n\theta = b^{1/n},$$

where a and b are the arbitrary constants; and therefore, &c., as regards the property—

Since, for the two conjugate states of strain of which $u = r^n \cos n\theta$ and $v = r^n \sin n\theta$ are respectively one the

potential and the other the displacement function, as appears from the above values of $\frac{du}{dx}$, &c.,

$$\left[\left(\frac{du}{dx} \right)^2 + \left(\frac{du}{dy} \right)^2 \right]^{\frac{1}{2}} = \left[\left(\frac{dv}{dx} \right)^2 + \left(\frac{dv}{dy} \right)^2 \right]^{\frac{1}{2}} = nr^{n-1},$$

and also, as appears from the same values,

$$\left[\left(\frac{d^2u}{dx^2} \right) \left(\frac{d^2u}{dy^2} \right) - \left(\frac{d^2u}{dx dy} \right)^2 \right]^{\frac{1}{2}} = \left[\left(\frac{d^2v}{dx^2} \right) \left(\frac{d^2v}{dy^2} \right) - \left(\frac{d^2v}{dx dy} \right)^2 \right]^{\frac{1}{2}} = n(n-1)r^{n-2}.$$

Hence, the first sides of these equations being proportional respectively to the molecular displacement and principal dilatation of the strain at the point xy of the lamina, *for the two conjugate states of irrotational strain of an incompressible lamina in the plane of its mass, for which $u = r^n \cos n\theta$ and $v = r^n \sin n\theta$ are respectively the potential and displacement functions or conversely, the molecular displacement and principal dilatation throughout the mass depend only on the distance r from the centre of the strain, and vary as the $(n-1)^{th}$ and $(n-2)^{th}$ powers of that distance respectively.*

R. TOWNSEND.

TRINITY COLLEGE, DUBLIN,

November 5, 1881.

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HERMATHENA.

PROPERTIUS: A REPLY.

WHEN a volume of selections is reviewed by a scholar like Professor Palmer* in a journal of the standing of HERMATHENA, the classical public naturally attach great weight to the criticism. And this must be my apology for the appearance of this Paper, in which I shall endeavour to show that some of the objections which Mr. Palmer has raised to methods and interpretations of mine are not so plausible as might at first sight appear. In doing so I shall confine myself in the main to passages where Mr. Palmer has supported his opinion at length, or where the question itself has a general interest. Before, however, controverting his opinions, I owe it as a prior duty to acknowledge the very cordial and generous terms in which he has spoken of my book. I prize this appreciation very highly, and I can only wish that my work was more worthy of it.

At the outset of the review Mr. Palmer regrets that in criticism his stand-point is often far removed from mine. If this were the case, I should have more reason to regret it than Mr. Palmer. But I trust an examination will show that it is not. Mr. Palmer illustrates or supports this by a supposed neglect on my part of a critical principle. He says (p. 326, *fin.*):

* [See Mr. Palmer's Article in HERMATHENA, vol. iv. p. 326.—ED.]

'Postgate does not yet fully appreciate the influence of proximity in causing corruption'; and again, p. 327, 'Postgate allows little influence to the important principle of proximity.' This attack shocks me. In this quarter at any rate I had deemed that I was secure. I have disregarded 'the influence of proximity'! Yet I turn over my commentary and I find in my note, I. 16. 13 (where I give, after Scaliger, *gravius querelas* for *grauibus querelis*), that I say '*gravius* was changed to *grauibus*, and *querelas* made to agree with it.' Again, on II. 7. 20, in justifying my emendation *nomine* for *sanguine*, a change approved by Mr. Palmer, I write '*sanguine* is prob. corrupt, and has got in from v. 16, where it comes in the same place.' On IV. 7. 46, *flere potest*, I explain the corruption of the original reading, *sat est*, by saying '*potest* in v. 38 induced the corruption.' So, IV. 18. 32, *portet* for MS. *portent*. 'The corruption arose from the copyists taking *animae* for *angels*' (plural). Once more, on V. 6. 45, I read '*pro*, MS. *prope*, which is due to the *homoeoteleuton turpe*. *Latinos*, MSS. *Latinis*, due to the attraction of *remis*.' Lastly, if I were at the last gasp, I might turn round upon my critic, and point to I. 9. 32,¹ where he still prefers the MS. *possis* to mine and Baehren's *par sis*, in spite of the important principle of 'proximity.' But let us now consider the passages on which Mr. Palmer bases the charge. The first is III. (IV.) 1. 27:

Nam quis equo pulsas abiegno nosceret arces,
 fluminaque Haemonio comminus isse uiro
 Idaeum Simoenta Iouis cunabula parui,
 Hectora ter campos ter maculasse rotas?

Though not prepared at present to surrender Wolff's

¹ 'Illis et silices *possunt* et cedere quercus;
 Nedom tu *possis*, spiritus iste leuis.'

conjecture, *Iouis cum prole Scamandro*, I will admit that it is not as certain as I formerly supposed. Like Mr. Palmer himself in his edition, I attributed too much importance to *lacunae* in N. But it is my non-acceptance of Mr. Palmer's *Idaeo sub monte* which shows my disregard of 'the principle.' I do not think that the emendation in itself is a very felicitous one, or particularly near to the MSS. But letting that pass, I ask Mr. Palmer how he explains the extraordinary fact that in speaking of the events of the Trojan war, which Homer has preserved from oblivion, Propertius has interpolated a line which has no connexion whatever with the subject of the Iliad? What has the birthplace of Jove to do between the battle of the rivers and the killing of Hector?

I next come to II. 5. 4, where my reading is:

Et nobis Aquilo, Cynthia, uentus erit.

Here 'proximity' bids me change *Aquilo* to *alio* or at least to *aliquo*, Lachmann. Now, whether I am right or wrong in keeping the MS. reading, I certainly have not overlooked the very obvious fact that the next word but one is *uentus*. There is something to be said for *Aquilo*: see my note, and Mr. Ellis's observations quoted there. However I have deferred so far to 'proximity' as to own that Lachmann's conjecture is 'inviting.' Further at present I cannot go. As between *alio* and *aliquo* I have no doubt. Even if *aliquo* cannot mean 'to some other place,' which Mr. Palmer seems to doubt, I prefer it to *alio*. The threat of leaving Cynthia gains in force, and the indefinite 'somewhere or other' agrees well with the next line—*inueniam tamen e multis fallacibus unam*.

The last passage is IV (v.) 6. 36, where Propertius says of Apollo:

Aut qualis flexos soluit Pythona per orbes
serpentem imbelles quem timere lyrae.

2 D 2

I had written 'There is no need to emend *deae*, &c., with Paley.' Mr. Palmer rejoins: 'Well, if there is no need to emend *lyrae* here, there is little need to emend anything. If the presence of *lyrae*, difficult though it be, were unaccounted for, it might stand. But when it is accounted for by the occurrence of *lyrae* four lines before, *there is surely every need to change it.*' Perhaps the phrase which I have marked with italics is to be taken as expressing the 'principle,' though it is not one which I should have expected to guide Mr. Palmer. 'When some reading which, 'though difficult, might stand'—and we used to be told that *proclivi lectione praestat ardua* is accounted for by the same word 'four lines before'—'there is every need to change it.' If this is a principle of criticism, then, to use Mr. Palmer's words, 'farewell, a long farewell, to criticism from me.' In my view, criticism should concern itself primarily with the MS. reading before it. It should ask: Is it corrupt? Is it senseless? And if not, then though difficult, as Mr. Palmer says, it should be permitted to stand; even though, as I would add, the same word appears four lines before. In Prop. I. 19. 3, *amore* concludes the line; three lines below it occurs again in the last foot but one. Are we to suspect *amore* here? In the same poem, line 12 ends with *amor*: the same word comes in the same place in line 22, and again in line 26. Why should the repetition of *lyrae* in our passage be more suspicious than that of *amor* there? Both are in my view sufficiently 'accounted for' by the appropriateness of the repeated word in each of its occurrences, and by the notorious fact that the ancient writers never troubled themselves about such repetitions. In general the proper employment of the principle of proximity, rightly understood, is not as an engine for disturbing a text, but as a support for a conjecture which is shown *on other grounds* to be necessary. And now for the text itself and Mr. Palmer's proposal. The

first I think I have sufficiently justified in my commentary; but I will venture to repeat its substance. The use of *lyrae*, 'lyres,' for 'performers on lyres' is in itself a natural and common one, and it is one which is found elsewhere in Propertius, III. 21. 8, qui, puto, *Arioniam* uexerat ante *lyram*. The conjunction *imbelles lyrae* for the Muses is supported by Horace, Od. I. 6. 10, *imbellis* que *lyrae* *Musa* potens. The only difficulty in the present passage is that *timuere* is somewhat harsh with *lyrae*, if the reader's mind is not thoroughly possessed with the idea that *lyrae* means the performers.¹ But it is not harsher than the parallel which I quoted from Statius, *Theb.* 7. 730, dum Marte propinquo horrent Tyrrenos *Heliconia plectra* tumultus—a passage which I have little doubt has been influenced by this. It is not as harsh as much in Propertius himself. If Mr. Palmer can swallow the camel of *tibia rauca* for the 'hoarse flute-player,' in IV. 9 (10.) 23: *tibia* nocturnis succumbat *rauca choreis*, why should he strain off the gnat of *imbelles lyrae* for the 'peaceful harpers.' But we have an alternative before us, and this must now be considered. Mr. Palmer proposes *ferae*—a 'bold' emendation he calls it. This is not my objection to it. I find it extremely tame. Compare the two pictures presented, the one by *lyrae* and the other by *ferae*. The theme of the poet is the transformation of Apollo Musagetes. The God of Poesy puts off his peaceful garb and looks, and appears as when he slew the monster snake. What can be more poetical than the way the contrast is suggested in this couplet? The maidens of his band are the timid, peaceful harpers still. But their young leader and defender is transformed. He is no longer the Apollo of the streaming locks, but the archer god of ven-

¹ We should remember that a beginning has to be made in such usages. 'The cornets ran away' would have

brought up a curious picture when the word was first transferred from the instrument to the officer.

geance ; and with his inevitable shafts he stretches out the creature dead and stark, before which they cowered in dismay. But what does the other reading give us? This monstrous dragon that it takes a god to kill—whom or what does he frighten? No creature of his own size or powers, no Nemean lion or Calydonian boar: not even the fierce beasts of the forest through which he winds. No, it is the ‘timorous cowerin’ beasties,’ ‘especially,’ says Mr. Palmer, ‘the imbelles *capreae* and *dammae*,’ the cowardly roes and does! What is bathos, I ask, if this is not?

Mr. Palmer feels ‘disappointed’ by the following remark. ‘The following seem to be all the certain instances (of lengthening in arsis):

Vinceris aut vincis: haec in amore rota est.’

He goes on to say: ‘Now I had fondly hoped that I had exploded this reading by writing *Vinceris: at vinces*: the confusion between *at* and *aut*, and between the terminations of the present and future being common in Propertius. My reading also gives the better sense:—“You are *now* conquered, but you *shall* conquer!” There is in this a proper comparison to a wheel. The unhappy lover’s good time will come, as surely as the under side of the revolving wheel shall come uppermost. And so Philistion, *πάλιν γὰρ ὄψει τῶν κακῶν περιτροπὴν* ἀεὶ γὰρ ὡς τροχὸς ὁ χρόνος κυλίσται, rightly gives the future ὄψει. But in the ordinary reading, “you conquer or are conquered,” there is no similarity to a wheel at all. Mr. Postgate, however, lavishes one of his *certain*s on the vulgate, leaving one single pentameter in the whole of Propertius labouring under a metrical defect, when the correction is simple and in accordance with all critical laws.’ Mr. Palmer has apparently two objections to the established reading—one regarding the metre and the other the sense. It

leaves, according to him, 'one single pentameter in the whole of Propertius labouring under a *metrical defect*.' What this metrical defect is I cannot comprehend. Of course under ordinary circumstances the *-is* of *uincis* is short; but Mr. Palmer is too learned a student of Latin poetry to need reminding of the frequency of *arsis lengthenings*. Perhaps it is its occurrence in *one single pentameter* that moves his suspicion. Yet a similar lengthening (*fuī*, v. (IV). 1. 17) occurs only in *one single hexameter*, and Mr. Palmer does not challenge that. Perhaps it is the lengthening at the end of the first half of the pentameter that he would deny. But this again is unwarranted. See L. Müller's treatise on Latin Prosody, pp. 331, 332, where the following instances are quoted beside the one in our passage. *Mart.* IX. 102. 4, *disce, Libyn domuit, aurea poma tulit*; *id.* XIV. 77, *Lesbia plorabāt, hic habitare potest*; *Marsus* (*Mey.* 123, 5), *nupsit, deposuit alter amicitiam*, *Auct. Carm.* in *Maeuium* (*Mey.* 821, 15): *debet qua rapuit, hac reparanda uiast*. It is to be noticed that in four out of these passages there is a pause at the end of the penthemimer. L. Müller goes on to use these examples to explain Catullus's practice of leaving a hiatus in the same place, as *ut Chalybum omne genus pereat*. Or lastly, is it the particular lengthening *is* that Mr. Palmer condemns? Well, what has he to say to *Pers.* 6. 6?

Emole; quid metuit? occa et seges altera in herba est,

or to Virgil, *Æn.* II. 111?

*Pacem me exanimis et Martis sorte peremptis
oratur? equidem et uiuis concedere uellem.*

His objection to the sense I can still less understand. He says that in "you conquer or are conquered" there is no resemblance to a wheel.' Why? He surely does not mean that, where two verbs in the same tense come together, they

must be strictly limited to the *same instant of time*? And if *uinceris aut uincis* can mean *nunc uincis, nunc uinceris*, the resemblance to a revolving wheel is obvious. It is a sufficient answer to an emendation to show that the MS. reading will stand. But apart from this, Mr. Palmer's proposal, though very ingenious, is itself unsatisfactory. The smart Ovidian antithesis *uinceris, at uincēs* is not in our poet's manner. It is just as impossible that he should have written it as the similar ingenuity which Hadr. Relandus foisted on him in II. 32. 6 (III. 30. 6):

Appia cur totiens te uia ducit? amas!

On I. 21. 9:

et *quicumque* super dispersa inuenerit ossa
montibus Etruscis, haec sciat esse mea,

Mr. Palmer upholds *quaecumque* against *quicumque*. Now here I have nothing new to add, but something to justify and explain. I cannot discuss the MS. reading here at length, as it involves the whole question of the respective values of the different MSS. of Propertius. I would only observe that if we read *quicumque*, which, whether the original reading or not, is certainly not a 'conjecture' of mine, no other change is necessary, whereas *quaecumque* involves two other alterations. My view of the situation as represented in the MS. reading, which I still see no reason to change, is briefly this: The soldier is told by his dying comrade, Gallus, to conceal the true circumstances of his death from his sister, and leave her to the fond supposition that he fell in honourable warfare against Augustus, not that he met an ignoble death at the hands of a chance brigand (*Gallum per medios ereptum Caesaris enses effugere ignotas non potuisse manus*); and, further, he is to see that his bones receive a separate burial—an interpretation which *prima facie* neither 'deprives the verse of its pathos,' nor 'makes it comparatively absurd.'

Mr. Palmer quotes me as saying 'I cannot believe that Propertius could have made Gallus say that *all* the bones on the mountains of Perusia (it should be *Etruria*) were his.' This argument he does not attempt to answer. Indeed, I do not see how he could. But he retorts he 'cannot believe that Propertius would make Gallus say that *every man that found bones* on the mountains of Etruria was to be informed that they were the bones of Gallus.' The retort is ingenious, but not quite fair. Mr. Palmer has confounded *quicumque* in the sense of 'the man, whoever he be, that,' where a single person only is meant, though his identification is uncertain, with *quicumque* in the sense of 'everyone that,' where each and everyone of a number of persons may be referred to. The first was of course the sense that I intended. The soldier is to inform the stranger, at present unknown, who should find the bones, that they are the bones of Gallus. Mr. Palmer proceeds: 'Postgate's reading deprives the verse of its pathos—the idea of the sister seeking her missing brother, and finding his bones upon the mountain.' I grant that I deprive it of this pathos, supposing it ever possessed it. But I also deprive it of something else. With my reading Gallus is no longer made to say that *all* the bones on the mountain—sheep bones, cow bones, and I know not what others—were his. The second charge which Mr. Palmer advances against my reading is that it makes it comparatively absurd. 'For if,' he continues, 'the ordinary stranger (*quicumque*) were told they were the bones of Gallus, he would probably reply he didn't care a nutshell whose bones they were. But the sister, she would care. She would gather the bones with loving hand,' and so on.¹ And again, 'And this, a Roman's burial, was what Gallus wanted; no

¹ By the way, what is Mr. Palmer's authority for the statement implied in

'the *distant* home where she and Gallus had played as children?'

mere vain request that each chance passer-by should know that he had fallen on that Etruscan hill.' Now, apart from his misunderstanding of my interpretation of *quicumque*, Mr. Palmer leaves out of sight the fact that I *have* supposed that the poem contains a request for burial. In my abstract of the poem's contents I say: 'Let not my sister learn from you the manner of my death, and *tell the finder of my bones to give them burial.*' And in my note, 'The soldier is to see that *Gallus's bones receive a separate burial.*' As to Mr. Palmer's general argument here, I know not what to make of it. What is the meaning of the innumerable addresses to the *ὁδοίτορος* and *viator* which we find on tombs; nay, what is the purport of monuments and inscriptions themselves if the passer-by is to be supposed to be thus indifferent to the common woe of humanity? The fond hallucination of grief that the ordinary stranger will feel some compassion for the fate recorded on the stone before him may be 'comparatively absurd.' But, at any rate, it has more pathos than the argument that contradicts it, and insists that he would not 'care a nut-shell whose bones they were.'

I have now done with the bulk of Mr. Palmer's Paper. There are of course remaining passages on which I might say something, but nothing that involves any point of fundamental importance. Before leaving it I would express a hope that in spite of appearances our principles of criticism—Mr. Palmer's and mine—are ultimately the same, and that they are the principles of sane and sober men who have attended to the subject; and if Mr. Palmer laments our differences in their application, I would comfort him¹ with the still true though trite expressions *quot homines tot sententiae* and *humanum est errare*.

Mr. Palmer has added a postscript touching on my

¹ And myself.

review of Propertius in the *Transactions* of the Cambridge Philological Society, vol. i., in which he has protested against my censure of his emendation of III. (IV.) 6. 22. I am glad to own that it is mistaken. But it is Mr. Palmer's printer who is responsible for the error. Mr. Palmer asks, '*giving domi for domo*,' what fault I have to find with it. With this correction I answer, None. It is very ingenious, and probably right. But the change of *domo*, the MS. reading, is not made in the text, nor is it mentioned in the critical notes; and with the retention of *domo* the reading certainly deserves the critical condemnation.

I hope that before long Professor Palmer will return to Propertian studies with a zest, and will give us some emendations as brilliant and as acute as his earliest ones of our author, or as those of Plautus and others which he has published in the last number of HERMATHENA; and that he will excuse the freedom with which I have criticised his remarks in this Paper—a freedom which is necessitated by the weight that his critical utterances carry: εἴτι καὶ φλαῦρον παραιθύσσει, μέγα τοι φέρεται πὰρ σίθεν.

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THE *COLONI* IN GAUL.

IN the year 1822, Savigny published his famous Essay on the Roman *Colonatus*;¹ and in it he suggested, as the possible origin of that condition, that certain masters had enfranchised their slaves, under the restrictions that the legal position expressed by '*colonatus*' afterwards made definite; and in support of this he appeals to the fact, that the *Colonus* called his master '*Patronus*.' But he adds that such a modified manumission would have been something quite novel and strange to the ancient law.² The objection that lies against this theory is, that such an important kind of manumission as one that bound the descendants would have assuredly been noticed by the juriconsults who were so opposed to the abuses of *patroni*, and so minute in their analysis of the different kinds of manumission.³

¹ *Vermischte Schriften* von Carl Friedrich von Savigny (Berlin, 1850), No. XV. There is an English translation in the *Philological Museum*, II. 117-145. I have given no account of the status of the *Coloni*. That has been done once for all by Savigny.

² See p. 48 of Savigny's Essay: 'Eine sehr natürliche Annahme würde darin bestehen dass die ursprünglichen Colonen (alle oder zum Theil) Sklaven waren, die man mit dieser Einschränkung frei liess, und der für den Gutsherrn gebrauchte Name *Patronus* könnte zur Bestätigung dieser Ansicht angeführt werden. Nur würde auch selbst in in einer so modificirten Manumission etwas ganz Neues dem alten Recht

völlig Fremdes gelegen haben.' (Ed. 1.)

³ This objection is made by Wallon, '*Histoire de l'esclavage*,' III. 279-80 (Paris, 1847). La liberté pouvait bien être accordée à l'esclave à la condition de rester au service de son patron: mais non pas d'y laisser après lui sa race. Une si énorme restriction n'eût pas manqué d'être signalée parmi les cas divers d'affranchissement que les juriconsultes analysent avec tant de minutie; c'eût été presque un rétablissement de l'esclavage: et disons-le non seulement il ne l'eussent pas omise, mais, avec leur juste défiance contre les abus du patronage, ils l'auraient expressément condamnée.

Anyhow, Savigny does not press it. For, in 1828, he published a second edition of his Essay, wherein he suggests a different origin for the Coloni. A few years before that date, a lost fragment of the Theodosian Code had been found. It is an edict of Theodosius, dated 409 A.D., relative to the Scyri, a race that had been recently conquered: 'Ideoque damus omnibus copiam ex praedicta gente hominum agros proprios frequentandi ita ut omnes sciant susceptos non alio iure quam colonatus apud se futuros.'⁴ There had been many such settlements of barbarians in the Roman territory before this, notably of the Marcomanni by M. Aurelius:⁵ and Savigny thinks that it is most probable that it was from such settlements that the legal condition in question arose. But he is by no means dogmatic. He considers it quite possible that the legal position of the Coloni may have originated otherwise, and to the class thus formed a wholesale addition made in these Scyri.⁶ However, in the Nachtrag to his Essay, published in 1848, after the elaborate treatment of the subject by Zumpt and Huschke,⁷ who had upheld the origin from settlements of the barbarians, he finally adheres to the opinion he had stated in 1828; and that

⁴ See Haenel's edition of the Theodosian Code, p. 460-1.

⁵ Capitolinus, 22, 2: 'accepitque in deditionem Marcomannos plurimis in Italiam traductis,' 24, 3: 'aequitatem autem etiam circa captos hostes custodivit: infinitos ex gentibus in Romano solo collocavit.'

⁶ After his account of the Scyri, Savigny adds (51, Ed. 2): 'Allein für nothwendig kann ich diese Annahme durchaus nicht anerkennen: vielmehr ist es eben so denkbar dass die erste Entstehung des Colonats eine ganz

andere war, und dass hier nur ein längst bekanntes und ausgebildetes Rechtsverhältniss einmal auf eine grosse Zahl gefangener Barbaren in Masse willkürlich angewendet war.'

⁷ Zumpt. 'Ueber die Entstehung und historische Entwicklung des Colonats' in Rhein. Museum für Philologie, 1845, pp. 1-69. Huschke, 'Census der Kaiserzeit' (Berlin, 1847). I have not seen either of these works, and only know of them from Savigny and Marquardt.

opinion has remained the current one down to the present day.⁸

Now that these settlements of the barbarians were a most important factor in the whole condition of the Empire, from the first to the fifth century, cannot be denied. They begin, as Huschke justly says, from the time of Augustus. We find Augustus (Suet. 21) and Tiberius (Suet. 9)⁹ introducing Germans. M. Aurelius, his biographer¹⁰ tells us (Capitolinus, 24), placed an indefinite number of enemies on Roman soil. Probus¹¹ introduced the Basternae (Vopiscus, 18, 1.), Aurelian¹² had brought captives into Italy to till the uncultivated vine-lands from Etruria to the Maritime Alps (Vopiscus, 48. 2.); and Diocletian¹³ introduced many of the Carpi,

⁸ See the last edition (1878) of *Marquardt's*, 'Römische Staatsverwaltung,' Vol. II. pp. 232-236. *W. T. Arnold*, Roman Provincial Administration: London, 1879, pp. 160-164. Let me, in passing, pay a debt of gratitude for all the information obtained from this admirable work.

⁹ *Suet.* Aug. 21: 'Germanosque ultra Albim fluvium summovit: ex quibus Ubios et Sygambros dedentes se traduxit in Galliam, atque in proximis Rheno agris collocavit.' Tiberius, 9: 'Germanico (sc. bello) quadraginta millia dediticiorum trajecit in Galliam, iuxtaque ripam Rheni sedibus assignatis collocavit.'

¹⁰ *Capit.* M. Aurel. 24. 3. See note ⁸.

¹¹ *Vopiscus*, Probus, 18. 1: 'Facta igitur pace cum Persis ad Thracias redit et centum millia Basternarum in solo Romano constituit, qui omnes fidem servarunt.'

¹² *Vopiscus*, Aurelian, 48. 2: 'Etruriae per Aureliam usque ad Alpes maritimas ingentes agri sunt iique fertiles et siluosi.

Statuerat igitur dominis locorum incul-torum qui tamen vellent pretia dare atque illic familias captivas constituere, vitibus montes conserere atque ex eo opere vinum dare, ut nihil redituum fiscus acciperet sed totum p.R. concederet.'

¹³ *Eutropius*, IX. 25 fin.: 'Varia deinceps et simul et viritim bella gesserunt (sc. Diocletianus et Maximianus), Carpi et Basternis subactis, Sarmatis victis: quarum nationum ingentes captivorum copias in Romanis finibus locaverunt.'

Cf. *Eumenius*, Constantius, 21 (Panegyrici Latini, ed. Teubner, p. 147): 'Itaque sicuti pridem tuo, Diocletiane Auguste, iussu implevit deserta Thraciae translatis incolis Asia, sicut postea tuo, Maximiane Auguste, nutu Nerviorum et Trevirorum arva iacentia velut postliminio restitutus et receptus in leges Francus excoluit: ita nunc per victorias tuas, Constanti Caesar invicte, quidquid infrequens Ambiano et Bellovaco et Tricassino solo Lingonicoque restabat, barbaro cultore revirescit.'

Basternae, and Sarmatians into the Roman territory (Eutropius, ix. 25). Julian¹⁴ settled the Franci Salii along the Rhine (Am. Marc. xvii. 8. 4); and Theodosius¹⁵ placed many of the Alemanni as tributaries about the Po (Am. Marc. xxviii. 5. 15). The large tracts in Gaul that were uncultivated from want of men, and the tracts in Italy that later became uncultivated from decay of population, necessitated this introduction of the barbarians. The Romans wanted cultivators for their lands, and lands were just what the barbarians wanted. The Goths and Huns, and other nations, were pressing down from the north and east, and driving the Germanic tribes into the Empire. The colonatus is the very condition that would seem to be suitable for conquered enemies (for as such they appear in the Roman annals); it was something better than slavery; so that in giving it to the conquered, the conquerors may be said to have observed much humanity towards them (Capit. M. Aurelius, 24);¹⁶ and when we have the direct statement from the edict of Theodosius about the Scyri, that the conquered were put into that class, the evidence might seem to be complete.

That there was such a category to put conquered enemies in for Theodosius and even for Aurelian cannot be disputed. It is barely possible, too, that the early introducers of the barbarians devised such a condition for them: but there is really no evidence for it. Neither Suetonius nor Capitolinus mention the terms on which the conquered enemies were located on Roman soil. Of

¹⁴ Francos, quos consuetudo Salios appellavit, . . . iamque precantes potius quam resistentes in opportunam clementiae partem effectu victoriae flexo dedentes se cum opibus liberisque suscepit.—*Ammianus*, xvii. 8. 4. Cf. *Gibbon*, II. 381, and note (Bohn).

¹⁵ Alemannos . . . agressus Theodosius . . . quoscumque cepit ad Italiam iussu Principis misit, ubi, fertilibus pagis acceptis, iam tributarii circumcolunt Padum.—*Ammianus*, xxviii. 5. 15.

¹⁶ See note 5.

course nothing definite can be concluded from silence; but it is strange that we should not hear more about such an artificial status and mode of land-tenure, and one so unusual with the Romans previously.¹⁷ So that it will be well to see if some other kind of origin cannot be discovered for it than that of the fiat of one of the early Emperors: and what I purpose endeavouring to maintain is, that it arose gradually as a fact from impersonal causes, then became recognised as a fact, and afterwards was consecrated by law: that it is more probable that the first settlers of the barbarians in Gaul gave them small tracts of land of their own, and treated them as independent freemen; that these stood equal in the eyes of the law with the poorer classes of the provincials; and that it was the same series of causes that merged them and the humbler provincials into the one common class of *Coloni*. *They* were not the original to whose state all the rest were brought, though their great numbers were, no doubt, an indirect cause of the decline of the condition of both. It was the misery and oppression that fell upon the whole Roman world, during the third and fourth centuries, that were the real causes.

Let us, then, see what data we have to form an opinion at all upon the subject.

Now we know that the settlers introduced into the

¹⁷ The passage appealed to by those who maintain that there was always something like the *colonatus* is *Varro*, R. R., I. 17: 'Omnes agri coluntur hominibus servis aut liberis aut utrisque: liberis aut cum ipsi colunt ut plerique pauperculi cum sua progenie: aut mercennariis cum conducticiis liberorum operis res maiores ut vindemias ac foenificia administrant: iique quos obaerarios (al. obaeratos: operarios)

nostri vocitarunt et etiam nunc sunt in Asia et Ægypto et in Illyrico complures.' Savigny wishes to interpret 'iique' as 'iique sunt,' and to take 'obaerarios' to mean 'operarios,' or else read the latter. He says the 'obaerati' must have been so few in *Varro*'s time as to be hardly worth mentioning. The passage seems to me too general and uncertain to be the basis of any theory.

Empire in the first two centuries were Germans; that what the Romans wanted was a population to till the vast tracts of uncultivated lands in their dominions, and that the Germans wanted land; and that the system of living the Germans were used to was the Mark or village-community¹⁸—a system, let us remark by the way, almost incapable of being violently disrupted by legislation.¹⁹ If we remember all this, what can seem more natural than that the Romans should settle them on the vast quantities of waste land at their disposal (some had never been cultivated, much had been desolated by war), and make them pay taxes just like the cultivators of the *agri stipendiarii* in the provinces. The Germans, then, who had just arrived at the agricultural stage,²⁰ settled down in their village communities, paid their tribute to the head-man, who transmitted it to the state. This seemed very fair to the Germans, as it did not subject them to a mode of life they were unaccustomed to and considered degrading (for the colonus was just what the German slave was), and it assured the Romans the better and

¹⁸ See Chapter VII. of M. de Laveleye's elaborate work on Primitive Property (Eng. Trans., London, 1878): *The Germanic Mark*, pp. 100–121.

¹⁹ For one example, among many that might be quoted, see Sir George Campbell *On the Tenure of Land in India* (Cobden Club Essays on Land Tenure: London, 1881), p. 255, note: 'The most curious proof that the natives do not necessarily prefer the separate to the joint system is found in the fact, published in some of the official papers of the Madras Presidency, that in that country villages were found which, for half a century, had submitted to the farce of a Government assessment on

each individual, but had year by year lumped the individual assessments together, and redivided the total in their own way among the members of the community.'

²⁰ De Laveleye, pp. 101, 108. That there were vast quantities of uncultivated lands, especially in the North, see Dareste de la Chavanne *Histoire des Classes Agricoles*, pp. 33, 4, as quoted in Mr. Spencer's *Descriptive Sociology*, No. 8, p. 7a: 'In the North these lands were so extensive, that Augustus was obliged to establish on them Barbarian Colonists to get the good of them, and all his successors followed his example.'

readier payment of their taxes; so that, judging *a priori*, this would seem a probable enough arrangement.

But there is some, though indistinct, evidence²¹ of the existence of such large village communities, and, indeed, of groups of villages, inhabited by Germans. The village of the Warisker, on the banks of the Doubs, probably contains the name of the Narisci, settled there by M. Aurelius. We hear of this settlement in the eighth and ninth centuries, that the inhabitants had legends of having come from the East. Near the same place Constantius Chlorus planted Chamavi and Frisii in a district near Langres, and there still existed there in the Middle Ages a tract called the village of the Chamavi and Attuarii. Elsewhere there were villages of other conquered nations, for example, the village of the Carpi (Amm. Marc. 27. 5. 5) on the Danube, where Valens fell in 368 A.D. This evidence is, as I have said, indistinct; but we can see reason why it should be so. The tenure of village communities does not appear clearly asserted, because the Romans were not at any great interest to understand it. It did not, as far as fiscal purposes were concerned, appear in the taxation districts the Romans formed in every province.²² They considered the land held by these settlers imperial property, as they did all the *agri stipendiarii* (cf. Richter, p. 201). They got their tribute from the large landholder or the town or the village headman, and they thought very little of the exact relation each stood to those he got the taxes from. Probably they

²¹ The materials of this paragraph are taken from Dr. Heinrich Richter's work *Das weströmische Reich*, 375–388 A.D. (Berlin, 1865), who himself quotes from Zeuss. See especially pp. 196, 7, 200, 1. Bk. I. chap. iii. is an exhaustive account of the Germanic element in the Roman Empire. Compare also Gibbon I. 434, about

Probus' and Diocletian's treatment of the barbarians.

²² W. T. Arnold, p. 26: 'In any case one innovation was always carried out, namely, the division of the country into "taxation districts," each with a town for its capital, whose magistrates were bound to pay over the amount of taxation due from each district.'

made their settlement (*i.e.* arrangement as to the amount of taxes to be paid) with the chief of the conquered tribe, and appointed him tax-collector; for *homines stipendiarii*²³ were usual where there was no town in existence in the provinces: and they considered these tax-collectors landlords, just as Lord Cornwallis did the zemindars in Bengal.²⁴

Further, there is some indirect evidence tending to show that large masses of these settlers were located together. Else how would, for example, the Franks²⁵ have been able to join together and embark on the romantic voyage to their homes? The Germans whom Probus²⁶ sent to Britain must have been united; else how would they have lent the yeoman's service they did to Constantius against Carausius? This latter, too, is a proof that there must have been much fair treatment of such Germans by the Romans. We can hardly believe that the huge masses of the so-called conquered—for example the 100,000 Basternae,²⁷

²³ W. T. Arnold, p. 201: 'When there were no towns we find "*homines stipendiarii*" instead of "*civitates stipendiariae*," and in most cases the State itself had to look after the lists, and direct all that machinery of administration which elsewhere was taken off its hands by the towns.'

²⁴ De Laveleye, pp. 229, 313; Maine, *Village Communities*, p. 105.

²⁵ Gibbon, I. 404: cf. *Panegyrici Latini*, V. 18 (ed. Teubner), "*incredibilis audacia et indigna felicitas*."

²⁶ Gibbon, I. 403: cf. Richter, p. 197; 'Den Franken und Alamannen waren Burgunder und Vandalen zur Hülfe gezogen. Probus besiegte sie, liess die Gefangenen nach Britannien überschiffen und ihnen Land zuweisen. Sie waren fleissige und treue Unterthanen; ihre Menge war so gross, dass sie den Kaiser gegen einen Usurpator auf jener

Insel die wesentlichsten Dienste leisteten. Man will im heutigen Cambridge-shire die Gegend gefunden haben wo jene Germanen ihre Aecker bebauten.'

²⁷ Wahrscheinlich mehr durch *Unterhandlung* als durch Waffengewalt brachte Probus 100,000 Bastarnen dazu, über die Donau zu wandern, und Sitze in dem verwüsteten Thracien anzunehmen. Richter, p. 197-8: cf. *Vopiscus*, Probus 18. 2, 3, quoted in note 11. Also Richter, p. 677, note 53; 'Von Sybel (*Deutsche Unterthanen*, p. 29) entzieht die Vandalen und Burgunder, welche Probus in Britannien ansiedelte, dem Colonatsverhältniss und giebt ihnen Beibehaltung deutschen Rechtes. Doch sind sie, so viel sich sehen lässt, unter denselben Bedingungen angesiedelt wie die Chamaver und Attuarier, welche von Sybel dem Colonat zuweist.

not to speak of Gepidae, Ostrogoths, and Vandals, that Probus introduced into the Empire—would have submitted to the terms of the colonatus. For let us not forget that it would be in the eyes of the Germans exactly the same as slavery. ‘*Ceteris servis,*’ says Tacitus (Germ. 25) ‘*non in nostrum morem discriptis per familiam ministeriis utuntur: suam quisque sedem suos penates regit: frumenti modum dominus aut pecoris aut vestis ut colono iniungit: et servus hactenus paret.*’ There is thus considerable probability that in the case of these wholesale settlements of the barbarians they were given large tracts of unoccupied land, and were at first under no other restrictions than those of all the other provincials. They fell into the order they were used to, viz. that of village communities.

Many Continental writers on Land Tenure represent the village community as a sort of ideal system; and no doubt it has its advantages. But we are very far from an ideal system of land tenure and cultivation when we are regarding that represented in the Theodosian and Justinian Codes. Long before that time, however, the village communities had broken up among the German inhabitants of the Roman Empire. A state of equality and equilibrium cannot be maintained anywhere for any considerable length of time; much less could it under the military and aristocratic government the Romans always exercised. What, then, were the causes that led to this break up?

Sir Henry Maine has set forth admirably, in his fifth lecture on ‘Village Communities in the East and West,’ the way irregularities arose in the Teutonic village community. There was always in the villages a chief family, or some families who were especially honoured, no doubt as being direct descendants of the common ancestor. These were considered superior to the rest of the inhabitants, and from these were selected the chiefs, in war to be generals, and in peace to be governors. When a division of pro-

perty, especially after war, took place, the chief got a larger share than the rest: indeed when any disturbance took place in the even course of the life of the village, the chief or leading family tended to increase. Now this chief or family, gaining power, used to reclaim portions of the waste land of the community, which thereby became his own, and till it by means of his retainers (who these were will appear later). He was also able to encroach on the pasture land of the community, and even to some extent into the arable land, especially in those respects in which the rights of the community were not very definitely appreciated. But, above all, he was able to sever his land from the rest, and so till it as he wished, and not according to the customary method of the villagers. The chief thus became quite separate from the other inhabitants.

Such are some of the causes Sir Henry Maine gives as having tended to produce irregularities in village communities in Teutonic lands. They are such as probably had considerable influence on the Germanic village communities in Gaul. But the most important was the fact, that in all likelihood the Romans made their arrangement about taxes with the chiefs, and thereby definitely fixed the rights of those chiefs in relation to all the other classes; 'and in the vague and floating order of primitive societies, the mere definition of a right immensely increases its strength.'²⁸ It was like the English settlement in Oudh: the chiefs tended to become a landed aristocracy, as the Talukdars are tending at the present day.²⁹ Hence we may see reasons why most of the village communities in Gaul lost their distinctive character at such an early date, and became simple *latifundia* of their chiefs. According to M. de Laveleye (*Primitive Property*, p. 241, Eng. Trans.), the disturbing elements in the case of the European village

²⁸ Maine, *Village Communities*, p. 150.

²⁹ Maine, p. 105; De Laveleye, pp. 315-317; Campbell, pp. 277-286.

communities have been feudalism, a privileged aristocracy, monarchic despotism, and administrative centralization. These virtually existed in the Roman government.

But it must not be supposed that all the Germans we find in the Roman Empire in the fourth and fifth centuries were or had been located in the form of village communities. The probability is that the mass were so located in those regions that had no owner, and so belonged directly to the State. Where a region that was the property of individuals was desolate and required cultivators, captives were given to the owners to put the land under cultivation. Such were the captives mentioned by Vopiscus (48. 2), as given by Aurelian to the landholders in the tract along the Via Aurelia, from Etruria to the Maritime Alps. These were from the very beginning *Coloni*. The reason why these captives were made *Coloni* and not slaves, and those mentioned in the edict of Theodosius (of 409 A.D.) are so expressly and strenuously forbidden to be made slaves of, can easily be seen from reading the continuation of the edict: '*nullique licere ex hoc genere colonorum ab eo cui semel attributi fuerint vel fraude aliquem abducere vel fugientem suscipere, poena proposita quae recipientes alienis censibus adscriptos vel non proprios colonos insequitur. Opera autem eorum terrarum domini libera utantur, ac nulli subacta (tilled lands) peraequationi vel censui subiaceant; nullique liceat velut donatos eos a iure census in servitutem trahere urbanisve obsequiis addicere.*'³⁰ It was purely fiscal; for all citizens were liable to the poll-tax and the land-tax; and all not slaves were

³⁰ The text is as given by Haenel in his edition of the Theodosian Code. His conjecture '*nullius*' before '*subacta*' is, I think, right, p. 460, 1. For the word '*obsequium*,' compare Wallon, III. 218, 9: 'un seul mot résume tout le

travail de l'empire: c'est le mot qui exprime les devoirs de l'esclave, ou si l'on veut, ce système d'obligations qui faisait pour l'affranchi comme une continuation de son esclavage, *obsequium*.'

Roman citizens since the edict of Caracalla in 215, A.D. We also hear of *Coloni municipiis attributi*;³¹ they were given and received from just the same reason as those allotted to private landholders. A corporation in the eyes of the law as regards property was much the same as an individual.

But there is yet another class of Germans in the Roman empire which we must not overlook. As at present towards America, so it seems highly probable that then there was a constant emigration of Germans moving in small bands, or as individuals, from their poor soil and troubled country to seek some means of existence in the Empire.³² They entered as artisans, labourers, and menials. Those who did not flock to the towns in many cases got land from the large landholders, or the chiefs of the Germanic village communities, who had virtually become or were becoming such. The landowner gave them a certain portion of land on condition of payment of a fixed rent and of definite services. They got the land 'per beneficium' or 'per precarium,' as it was called.³³ Such tenants were to a

³¹ Richter, 200.

³² This is urged in a famous article by M. Fustel de Coulanges in the *Revue des deux Mondes* for May 15, 1872: 'L'Invasion germanique au V^{me} siècle, son caractère et ses effets.' The first part of the essay is directed against the idea that there was a combined effort among the Germans against the Romans, or that they won their settlements in the Roman Empire by force of arms. Rather they were isolated tribes or individuals who sometimes gladly took the land assigned to them to cultivate, though often they were forced to take it. This is all very sound. But M. de Coulanges writes, as usual, with a very strong bias of patriotism, and surely he pushes the insignificance of the Franks too far, as he does of all the Germans.

Compare, for example, what he says about the Alemanni, p. 248, with Gibbon, I. 325, 6.

³³ De Laveleye, p. 232: 'When the proprietor granted land, reserving certain payments and services, to a tenant who thus became his vassal, a *beneficium* was constituted. When, on the other hand, an impoverished proprietor, threatened or continually harassed, surrendered his land to some powerful man capable of protecting him, reserving, however, to himself the hereditary enjoyment of the property for certain rents and services, there was a *commendatio*.' Compare Fustel de Coulanges in *Revue des deux Mondes* for May 15, 1873, especially section III., 'De la possession bénéficiaire dans l'empire romain,' pp. 451-9.

great extent under the master's authority, and helped him vastly in gaining a superiority over the smaller landholders.

This kind of relation to large landowners the Germans readily availed themselves of; and they found it all the more easy to do so as it was a constant practice in Gaul. In any society which is composed of closed units, whether tribes or families, a class of homeless wanderers and fugitives must arise. We find such a class in Switzerland and Russia at present.³⁴ Such, too, were the Ambacti, the Clientes, and the Obaerati³⁵ we read of in Cæsar. In fact it seems to have been very usual indeed among the Kelts, for those who by any chance had lost membership of a tribe or sept to join themselves as retainers to the great, as for example the *fuidhars* in Ancient Ireland.³⁶ We may be very sure that practice did not die out after Cæsar's conquests, but that all those who by the force of circumstances became poor and without land thus attached themselves round some lord; and if one class rather than another must be selected as the origin of the Coloni, it is this class that might be most reasonably taken; and the nucleus of this class was Keltic and not German.

Large landholders have always a tendency to swallow up the small ones—the more so when the small ones are independent, not joint proprietors, when the large and rich landholders get crowds of retainers, and when the state is

³⁴ De Laveleye, 237.

³⁵ Caesar, *Bell. Gall.* I. 4: 'Et omnes clientes obaeratosque suos quorum magnum numerum habebat eodem conduxit' (sc. Orgetorix). VI. 15: 'Atque eorum ut quisque est genere copiosius amplissimus ita plurimos circum se ambactos clientesque habent.' VI. 13: 'Plerique cum aut aere alieno aut magnitudine tributorum, aut injuria potentiorum premuntur, sese in servitutem

dicant nobilibus. In hos eadem omnia sunt iura, quae dominis in servos.' Cf. III. 17; VII. 4.

³⁶ See especially Maine, *Early History of Institutions*, chap. VII., 'The Chief and the Land,' pp. 165, foll.; also De Laveleye, p. 237. Maine quotes Mr. Hunter as telling us that there is an exactly similar class to the *Fuidhars* in the migratory husbandmen of the Indian province of Orissa.

at any rate not adverse to the principles of *latifundia* ; all which circumstances existed in the Roman Empire. Still the small farmer prospered during the first two centuries ; and it was not till the misery and trouble that came from the wars and pestilences of the third century that this class began seriously to decline, and they were reduced to surrender their lands to the rich or 'commend' themselves,³⁷ as it was called. The rich took the ownership of the land and made the former owners tenants, thus assimilating them to the tenants previously mentioned ; and when the stringent laws of the fourth century were enacted, all these tenants were merged in the class of Coloni. Still we may be sure that the independent farmers died hard, and were the last additions that were made to the great domains of the rich.

Let us sum up, then, the agricultural classes that appear in Gaul during the early centuries of the Christian era. There were—(1) the large landholders. Some were Germans, chiefs of their villages and tribes, who gradually changed, at least in the eyes of the law, these village communities into manors, of which they were the lords : some were Roman and Gallic owners of *latifundia*, individuals or municipalities. These worked the land they kept as their special property by slaves, and let the remainder to a constantly increasing number of (2) retainers and tenants. Lastly, there were—(3) the independent small farmers, who were gradually decreasing.

The taxation on these classes steadily increased as time went on. During the first and second centuries we hear flourishing accounts of Gaul. Cæsar's intended denationalization of them was a great success. They became Romanized with the utmost readiness, and were for the most part staunch and loyal to Rome. The fact that all

³⁷ See note 33.

Gaul was kept in check by a garrison of but 1200 men at Lugdunum³⁸ shows that there was little disaffection. Immediately after the conquest, except the tribute, 'everything was in the same condition as in the time of independence, except that there was more information, more security, more industry, and greater peace. It was a happy situation for the Transalpine nations, a natural and easy transition to the political dependence which the Roman conquest imposed on them.'³⁹ Under Augustus we have his great census⁴⁰ and reorganization, whereby the old divisions into peoples, tribes, and nations were broken up, and the country redistributed into urban districts, for the greater facilities of taxation.⁴¹ The taxation was no doubt heavy, but it was fair and consistently exacted. There was little or no peculation by the governors.⁴² Under the early Emperors the governors of the provinces were held in the strictest control. Tacitus⁴³ himself allows this in the case of Tiberius. The same author tells us of the wealth of Southern Gaul.⁴⁴ Claudius gave many of the notables the right of sitting in the Senate. Under Nero Gaul was more prosperous than ever.⁴⁵ If the taxation was increased under Vespasian,⁴⁶ it was lightened under Hadrian.⁴⁷ All Gaul had received the franchise by the end of the reign of Antoninus Pius.⁴⁸ We hear, in fact, little of it, except its prosperity, during

³⁸ W. T. Arnold, p. 103.

³⁹ Thierry, *Histoire des Gaulois*, III. 268, as quoted in Mr. Herbert Spencer's *Descriptive Sociology*, No. 8, p. 43 a.

⁴⁰ W. T. Arnold, 91 foll.

⁴¹ *Ibid.*, p. 204.

⁴² *Ibid.*, pp. 117, 8.

⁴³ Tacitus, *Annals*, IV. 6: 'Et ne provinciae novis oneribus turbarentur utque vetera sine avaritia aut crudelitate magistratuum tolerarent, provide-

bat. Corporum verbera, ademptiones bonorum aberant.'

⁴⁴ *Ann.* XI. 24: Since the conquest of the Gauls there has been 'Continua inde et fida pax. Jam moribus, artibus adfinitatibus nostris mixti, aurum et spes suas inferant potius quam separati habeant.'

⁴⁵ W. T. Arnold, p. 137.

⁴⁶ *Ibid.*, 138.

⁴⁷ *Ibid.*, 143, and the references.

⁴⁸ *Ibid.*, 145.

all this time. There were revolts under Tiberius,⁴⁹ and under Vespasian;⁵⁰ but they were partial and transient.

But from M. Aurelius on to Diocletian things are steadily getting worse. The plagues that fell upon the Roman world towards the end of the second century were indeed a crisis, and their influence is strongly and not unduly insisted upon by an eloquent writer.⁵¹ The barbarians begin to encroach on all sides of the frontier, and so the necessities of the State get greater to keep them off. At the same time the country is getting poorer. Even during the first two centuries, amid all the greatness and wealth of Gaul, many of the causes that produced her subsequent misery were actively at work. Readily as Gaul availed herself of the advantages of Roman civilization, she was equally ready to adopt her defects. When not fighting, soldiers are indolent, and the laziness of the Roman at peace was soon adopted by the Gaul.⁵² The Roman land laws, too, were always in favour of landlords accumulating large estates; and though this never came to the same pitch in Gaul as in Italy⁵³—partly owing to the proportionally smaller number of slaves in Gaul⁵⁴—still we must believe that the inequalities of wealth were very great: the more one has the more he can get, and so the ine-

⁴⁹ Tacitus, *Ann.*, III. 40.

⁵⁰ Tacitus, *Hist.*, IV., the revolt of Civilis.

⁵¹ J. R. Seeley, *Lectures and Essays*, pp. 55 *sqq.*: 'We are in danger of attaching too little importance to occurrences of this kind. . . . The battle of Cressy occupies the historian more than the Black Death, yet we know that the Black Death is a turning-point in mediæval English history.'

⁵² *Treviri et Nervii circa affectionem Germanicæ originis ultro ambitiosi sunt, tanquam per hanc gloriam*

sanguinis a similitudine et inertia Gallorum separentur (Tacitus, *Germ.* 28).

⁵³ *Latifundia perdidere Italiam, iam vero et provincias.* Pliny H. N. XVIII. 7. 3.

⁵⁴ *Dareste de la Chavanne*, 56, 7, as quoted in Mr. Spencer's *Descriptive Sociology*, No. 8, p. 7 b: 'Slaves must have been much less numerous in Gaul than in Italy. Commerce, luxury, and public corruptions accumulated them in the capitals of the Empire; but Gaul did not exist under those conditions.'

qualities tended to increase. Such a condition will go on unperceived till a crisis comes—some violent strain—and then the feebleness will appear. This came in the latter half of the second and third centuries. The stringent demands of the ‘*fiscus*,’ which was slow to grant any indulgences, pressed heavily upon the small proprietors,⁵⁵ and they, gradually becoming poorer and poorer, and consequently more defenceless, naturally betook themselves to the rich, sometimes to borrow money, sometimes to seek protection. In any case, their lands soon got into the hands of the rich, and they themselves became workers where they had been owners. They would voluntarily surrender the ownership of their lands to escape the land-tax; or they would have to surrender their lands for non-payment of their debts. They were not much better off in their new position, for the master exacted from them extravagant rent and the utmost work. For a long time they could perhaps legally go away; but the master would not let them, and the weak always find it hard to get the law to aid them, especially in a taxing State, that has an interest in their staying where they are. Besides, where should they go? They had nothing, for their lands were gone; and they would fall into exactly the same condition elsewhere. Wherever they were, they remembered they were equally within the power of the master.⁵⁶

There was, besides, the positive and definite evil of increasing taxation.⁵⁷ Under the early Emperors it was heavy enough. There was the land-tax; the poll-tax for those who had no land; custom dues, $2\frac{1}{2}$ per cent. on all articles imported into Gaul; 1 per cent. on all goods sold

⁵⁵ They ‘commended’ themselves: see note ³³.

⁵⁶ Cicero (*Fam.* 4. 7) to Marcellus: ‘tamen id cogitare deberes, ubicumque esses, te fore in ejus ipsius, quem

fugeres, potestate,’ quoted by Gibbon, chap. iii. *ad fin.*

⁵⁷ Nearly all the material of this paragraph is taken from W. T. Arnold, pp. 187–200.

(centesima rerum venalium); 4 per cent. on the sale of slaves (quinta et vicesima venalium mancipiorum); and such taxes as the 'aurum coronarium.'⁵⁸ We do not hear anything very clearly about the taxation during the dismal century from 180 to 280 A.D.; but the government was sore pressed and constantly in difficulties. In 215, Caracalla gave all the provinces the franchise, not from any high statesman-like idea of an equally privileged and homogeneous empire, but for fiscal purposes, viz. to impose on them the 5 per cent. legacy duty, which had previously been confined to Italy as not paying the tributum.⁵⁹ We may readily suppose the taxation constantly increasing; for the amount of taxes we find about the beginning of the fourth century is something appalling,⁶⁰ and could never have been raised suddenly to such a height. And in addition to all these regular taxes there were many extraordinary exactions and unjust plundering by the collectors.⁶¹

After this century of decline, in the year 284 A.D., a great soldier is made Emperor.⁶² Diocletian had the firmest conviction of the omnipotence of rules and regulations: and his extraordinary energy and abilities elaborated and

⁵⁸ Originally a gold crown offered to a victorious general by provincials and allies. Even under the Republic it had become compulsory. In Augustus's time it was 35,000 lbs. of gold from all the provinces. It was paid in later times by the decurions, who were required to have a considerable amount of property.

⁵⁹ W. T. Arnold, pp. 154, 5. Gibbon, I. 212.

⁶⁰ Arnold, p. 200: 'The portoria were growing heavier during this period (sc. from M. Aurelius to Diocletian) till they reached the frightful rate of 12½ per cent. in the fourth century. The

new imposition of the legacy-duty on the provincials was bad enough: but it was the land-tax after all which was the crushing burden. It was this that made slaves of the municipal magistrates, and which made the hard-tasked victims of the terribly perfect machine of administration welcome the barbarians rather with hope than with despair.'

⁶¹ J. R. Seeley, *Lectures and Essays*, p. 71: 'Extravagance involved oppressive taxation, and the agents of this taxation, the official class, irresistibly formed the habit of rapacity.'

⁶² Gibbon, chap. XIII.; Seeley, *Lecture III.*; Arnold, 159-176.

put in action a system of administration such as has rarely been seen for mechanical perfection. The division of the Empire first with Maximian, then the subdivision by nomination of the two Caesars, were adopted mainly on military grounds for the protection of the provinces. But they served to bring about a greater centralization. It is from Diocletian's time that all the really severe laws against the agriculturists are enacted.⁶³ The reins of government are tightened everywhere. The land-tax is imposed anew on Italy, it must be confessed justly, as she was no longer the protectress of the provinces: the poll-tax is taken off the towns only to fall with greater weight on the unfortunate agriculturists. In true military style, summary jurisdiction is made to supplant that by the magistrate and the judices. When prices are rising an edict is passed regulating the 'maximum' articles are to be sold at.⁶⁴ Every department in the State is a species of 'militia.'⁶⁵ It was Oriental despotism, and deliberately adopted, down to the

⁶³ The same was the case with the artisans: 'Almost all the laws that make the workman feel his servitude belong to Cent. IV. Then it was that the wholesale chaining to their posts began.' Levasseur, *Histoire des classes ouvrières*, as quoted in Mr. Spencer's *Descriptive Sociology*, No. 8, p. 8 b.

⁶⁴ This latter edict is extant. It is elaborately edited by M. Waddington. The ignorance among the Romans of the elementary principles of political economy has often been noticed, e.g. Merivale, VIII. p. 356: cf. Seeley, *Lecture II., ad. fin.*: 'Roman finance had no conception of the impolicy of levying taxation so as to depress enterprise and trade. The fiscus destroyed capital in the Roman Empire. The desire of accumulation languished where govern-

ment lay in wait for all savings—locupletissimus quisque in praedam correptus.'

⁶⁵ Cf. Seeley, p. 69; Wallon, *Histoire de l'esclavage*, III. 126: 'Le service public devint un office public, et, sous un gouvernement militairement constitué, une milice. Il y en eut trois sortes, alors: la milice du palais (*palatina*), la milice de l'administration (*officialis*), et la milice armée, la milice militaire (*militia militaris*): il fallait doubler le mot pour exprimer suffisamment la chose. . . . Dans toutes les fonctions qui le (sc. le service public) composent, l'homme libre cessera généralement d'être maître de sa personne: et par là, la servitude reprendra aux dépens des citoyens tout ce que semble gagner la liberté.'

very magnificence and mystery with which Diocletian surrounded himself. The administration was carried on by a hierarchy of officials; they were everywhere, and everywhere oppressive, and, besides oppressive, wasteful and rapacious.⁶⁶ For taxation, the regular device of military despotism⁶⁷ is now made the law, and the tax-payer, be he agriculturist or artisan or curial of a town, is attached to his post.⁶⁸ The burdens are so excessive that the sufferers, as we are assured by an eloquent bishop,⁶⁹ would gladly fly away to the barbarians if they were let. But the government cannot do without them; so it fixes them to their land and their office. It has appeared above that, practically, the agriculturist had been gradually⁷⁰ becoming fixed to his post, but now he is fixed legally; he has become a 'servus terrae,' and that is the distinctive mark of the Colonus.

It is maintained, then, that we cannot fix upon any definite class as the original of the Coloni. The Germans introduced into Gaul during the Empire were in very few cases such. They mostly stood in the same position to the State that the ordinary provincials did. The causes that

⁶⁶ See Seeley, quoted in note 61.

⁶⁷ We find the same immobilization of the people in the great military Empire of Ancient Mexico: cf. Mr. Spencer's *Descriptive Sociology*, No. 2, p. 12 b.

⁶⁸ Detailed account in Wallon, *Tom.* III. chaps. 4-7, especially the seventh.

⁶⁹ Salvianus, Bishop of Marseilles. *De Gubernatione Dei*. Lib. V. 8, as quoted by Mr. Herbert Spencer, *Political Institutions*, § 443.

⁷⁰ Mr. Arnold says (p. 163 note): 'It should be mentioned that our only full authorities for the Coloni are of a later date (sc. than Diocletian). But

there is every reason to believe that what was true of the fourth century was true of the third; and the Bagaudae prove it.' I think not. Rebellion is likely to occur when oppression is beginning and growing, or again, when it is relaxing. The administration from Diocletian on became too strong and the isolation of the oppressed too great to admit of any concerted rising. The mechanical perfection of the former might have been conceived, but could not have been carried out with such fatal success, unless it had been a *gradual* growth for long previously. For the Bagaudae, see Gibbon, I. 427, 8.

tended to produce the legal condition of the colonatus operated on all agricultural labourers and small landholders, and indeed on the middle and poorer classes generally. Such causes producing inequality exist more or less everywhere; but they existed in full force and volume in Gaul during the period we have been reviewing. There was the growth of *latifundia* and to a certain extent foreign competition: there was also that internal unproductiveness that is always found in a military and non-industrial state; but the main cause was the extravagant taxation that gradually increased from the time of M. Aurelius till it reached its climax in Diocletian and his successors. That taxation was necessitated by the exigencies of the State in its conflicts with the barbarians. This constant war developed the military and despotic system of government to an almost unparalleled extent; and one of the usual methods of such governments to facilitate its regulations when they transcend all justice is to fix each man to his post. With little internal productiveness, then, no external conquests to recruit from after a long peace, and pressed by enemies on all sides, if it was to hold out at all, an Empire like the Roman could do little else than grind down its subjects while it maintained its army. At least thereby it existed a little longer.

LOUIS C. PURSER.

MISCELLANEA.

THUCYDIDES.

IN the last HERMATHENA, No. VIII., I put forward a correction of Thuc. vi. 40, which, I think, is certainly demanded by the grammar and the order of the words. The sentence is—

ἡγησάμενοι τοῦτο μὲν ἂν καὶ ἴσον καὶ πλεόν οἱ ἀγαθοὶ ὑμῶν ἥπερ τὸ τῆς πόλεως πλῆθος μετασχεῖν.

I proposed to read—

ἡγησάμενοι τοῦτο μὲν ἂν καὶ ἴσον καὶ πλεόν οἱ ἀγαθοὶ ὑμῶν, ἥπερ τὸ πλῆθος, τῆς πόλεως μετασχεῖν.

τοῦτο μὲν means ‘in the first place,’ and corresponds to *εἰ δ’ ἄλλα βουλήσεσθε* in the next sentence. *ἴσον* and *πλεόν* are ‘to an equal extent,’ and ‘in a greater degree.’ What I wish to add here is that, in vii. 63, *οὐκ ἔλασσον* and *πολὺ πλείον* are used in just the same way. The sentence runs—

καὶ τῆς ἀρχῆς τῆς ἡμετέρας οὐκ ἔλασσον κατὰ τὸ ὠφελεῖσθαι, ἔς τε τὸ φοβερόν τοῖς ὑπηκόοις καὶ τὸ μὴ ἀδικεῖσθαι, πολὺ πλείον μετείχετε.

I have adduced this passage not only because it defends my view of vi. 40, but because I think it is has been itself sometimes inadequately explained. Nicias, in encouraging his army, says, addressing himself especially to that part of his army which was recruited from the allies, ‘you shared equally with ourselves in the substantial advantages of our empire, while you gained even more than

we by the dread which you inspired in subject-states, and in your security against injustice.¹

Dr. Jowett in his Notes explains: 'Nicias means to say that in positive benefits, such as pay and commercial advantages, the μέτροικοι and foreigners in the Athenian service were as well off as the Athenians themselves, while in freedom from liability to attack, *and the awe which they inspired in subject-states*, they were even better off; either because they were not so much exposed as Athens herself, or because they by themselves would be more helpless than Athens by herself.'

Dr. Jowett, observe, has clearly seen the difficulty. In what sense can it be said that the allies were *more formidable* to the subject-states than the Athenians themselves? The two answers which Dr. Jowett gives are unsatisfactory. Still less satisfactory is Classen's interpretation of the words ἐς τὸ φοβερόν τοῖς ὑπηκόοις. His paraphrase is '*in so fern die der athenischen ἀρχή Unterworfenen (οἱ ὑπήκοοι) Respect vor ihnen hatten.*' But this is an impossible rendering of τὸ φοβερόν, and it leaves the difficulty very much where it was. How was it that the subject-states had more respect, consideration, for the allies than for Athens?

I think we should translate τὸ φοβερόν τοῖς ὑπηκόοις καὶ τὸ μὴ ἀδικεῖσθαι, 'as regards that immunity from oppression which subjects have to fear.' Καὶ is simply explicative, as often in Thucydides, and τὸ φοβερόν is assigned the meaning which it usually bears in Thucydides and all Greek prose writers. Not that καὶ must necessarily be explicative here; τὸ φοβερόν may refer to all the ills which ὑπήκοοι might have to apprehend, and from which association with Athens might protect them; τὸ ἀδικεῖσθαι would be the oppression actually suffered.

¹ I give Dr. Jowett's translation.

It is to be observed further, that ὑπήκοοι, in vii. 57 and other passages, distinctly refers to the *subject-allies* of Athens, as opposed to the αὐτόνομοι. If ὑπήκοοι is to be taken in this sense here, it suits my rendering, but not the rendering which I condemn. The passage might then be thus paraphrased: 'There is a way of viewing your position as subject-allies which would show that you reap more, far more, benefit from the Athenian ἀρχή than we Athenians. You are subject to many a danger, you are threatened with actual oppression—from which we Athenians are absolutely secure, but which you subject-allies would very probably have to suffer but for your connexion with us.'¹

I may add, that in the next sentence ἄν need not be expunged. The words δικαίως ἂν αὐτὴν νῦν μὴ καταπροδίδετε may fairly stand (regard being had to Thucydidean license) for νῦν μὴ καταπροδίδετε αὐτὴν, δικαίως ἂν οὐ καταπροδίδετε.

For the adverbial usage of ἴσων and πλέον compare the much more daring adverbial use of μέρος in vii. 56.

To a note on Thuc. ii. 47, published in last HERMATHENA, I would add that I would read πρῶτον for τὸ πρῶτον.

Thuc. vii. 27, 28 well illustrate the fact that the Greek historical writers are often difficult solely because they lack those typographical devices which modern historians have. The greater part of two long chapters 27, 28, from δραχμὴν γὰρ τῆς ἡμέρας to πρόσοδοι ἀπώλλυντο, form in sense a note on the word πολυτελής, and would have been printed as a note by a modern writer.

¹ If φοβερόν means 'formidable,' one might explain, 'in so far as by your connexion with us you are formidable to the subjects, and so are safe from

that oppression (which we, of course, have not to fear); you are actually greater gainers by our empire than we are ourselves.'

VII. 47 :—

νόσῳ τε γὰρ ἐπιέζοντο κατ' ἀμφοτέρα, τῆς τε ὥρας τοῦ ἐνιαυτοῦ ταύτης οὕσης ἐν ᾗ ἀσθενοῦσιν ἄνθρωποι μάλιστα, καὶ τὸ χωρίον ἅμα ἐν ᾧ ἐστρατοπεδεύοντο ἐλώδες καὶ χαλεπὸν ἦν, τὰ τε ἄλλα ὅτι ἀνέλπιστα αὐτοῖς ἐφαίνετο.

Of course it is quite possible to take *ὅτι* after *ἐπιέζοντο*, 'they were distressed, both by sickness *and because* everything seemed to them hopeless.' But this is rendered very harsh by the fact that between *ἐπιέζοντο* and *τὰ τε ἄλλα ὅτι*, κ. τ. ἐ., there intervenes a sentence, καὶ τὸ χωρίον . . . χαλεπὸν ἦν, not introduced by *ὅτι* or any such particle. I propose

τὰ τε ἄλλὰ ὅ τι ἀνελπιστότατα αὐτοῖς ἐφαίνετο.

This provides a sentence constructed similarly to the foregoing clause. Words like *ἀνελπιστος*, *ἀπροφάσιτος* are often mistaken for superlatives by a certain class of students; and I think experience shows that many copyists will fall into the very same pitfalls as the *tiro* in scholarship.

VII. 75 :—

οὐκ ἄνευ ὀλίγων ἐπιθειασμῶν . . . ἀπολειπόμενοι.

'Unless the text is corrupt, *οὐκ* negatives both *ὀλίγων* and *ἀπολειπόμενοι*, a second *οὐκ*, which is required by the sense, being, through a confusion perhaps due to the sense of euphony, omitted.'

This is the just observation of Dr. Jowett. The text can hardly be corrupt, and none of the emendations of *ὀλίγων* recommend themselves. But the passage usually adduced as parallel from iii. 49 seems to stand on another footing. The passage is *ὅπως μὴ, φθασάσης τῆς δευτέρας, εὗρωσι διεφθαρμένην τὴν πολιν*, where the sense plainly requires a second *μή* before *φθασάσης*. In this case, I think

this second μή should be inserted in the text. Modern edd. hesitate to insert the μή, because if inserted the sentence runs awkwardly, by reason of the juxtaposition of μή, μή, the first μή being connected with εὐρωσι and the second with φθασάσης. But there is an exact parallel in Plut. Phaed. 90 D. :—

οἰκτρὸν ἂν εἴη πάθος εἰ . . . διὰ τὸ παραγίγνεσθαι τοιούτοις λόγοις τοῖς αὐτοῖς τοτὲ μὲν δοκοῦσιν ἀληθέσιν εἶναι, τοτὲ δὲ μή, μή ἑαυτὸν τις αἰτιῶτο . . . ἀλλὰ κτέ.

Here the first of the two particles, μή, μή, goes with δοκοῦσιν understood, and the second goes with αἰτιῶτο. The seeming awkwardness of the construction, from the point of view of the modern critic, is greater in the passage from Plato than in the Thucydidean passage corrected in the way which I propose.

ARISTOPHANES—*Acharnians*.

119 :—

ὦ θερμόβουλον πρωκτὸν ἐξευρημένε.

So this verse stands in the MSS. The conjecture ἐξευρημένε is 'from the purpose' of criticism. The Schol. tells us that σπλάγχχον was the word which stood in the verse of Euripides here parodied. It was governed, no doubt, by some such word as ἔχων, expressed or understood.

231 :—

The comment of the Schol. on this verse is σκόλοψ καὶ σχοῖνος αὐτοῖς ἄτ' ἐμπαγῶ. Hence it may be inferred that verse 231 should run thus—

καὶ σκόλοψ ὀξὺς ὀδυνηρὸς ἐπικώπος, ἵνα,

which corresponds to the strophic verse

σπονδοφόρος οὗτος ὑπ' ἐμοῦ τότε διωκόμενος.

The first cretic is resolved in the strophic verse, but not in the antistrophic. The same phenomenon is to be observed in the next verse, where in the last foot but one the cretic is pure in the antistrophe and resolved in the strophe.

262 :—

σὺ δ', ὦ γύναι, θεῶ μ' ἀπὸ τοῦ τέγους πρόβα.

Perhaps for θεῶ we should read θείου. It seems unnatural that Dicaeopolis should ask his wife to look on, whereas fumigation was an essential part of most Greek religious rites.

284 - 301 = 335 - 346 :—

In the scene between Dicaeopolis and the Chorus, the passage 284-301, beginning Ἡράκλεις, τουτὶ τί ἐστι and ending with ἰππεῦσι καττύματα, corresponds antistrophically with 335-346, beginning ὡς ἀποκτενῶ and ending τῇ στροφῇ γίγνεται. The following slight corrections then become requisite:—Verses 338, 339, should run—

ἀλλὰ νυνὶ λέγ' εἰ σοὶ δοκεῖ, τόν τε Λακε-
δαιμόνιον αὐτὸν δ, τι τῇ τρόπῃ σου φίλον.

And in verse 345 τὸ should be omitted before βίλος.

945-951 :—

ἀλλ' ὦ ξένων συκοφάντην.

The Scholiasts appear to have read

ἀλλ' ὦ ξένων βέλτιστε σὺ
τοῦτον λαβὼν πρόσβαλλ' ὅποι κτέ.

1093 :—

ὄρχηστρίδες, τὰ φίλταθ' Ἀρμοδίου, καλαί.

I read

ὄρχηστρίδες ἐς τὸ 'φίλταθ' Ἀρμόδι' οὐ' καλαί,

'dancing girls famous for the Harmodius song,' which is here designated by its first line, which ran—

φίλταθ' Ἀρμόδι' οὐ τί πω τεθνηκας.

These dancing girls, no doubt, sang, as they danced, this popular Athenian *σκολιόν*, to which allusion is made sup. 980. The Scholiast there tells us that the allusion is to the song of Harmodius, but such an allusion cannot here be attained without changing the text. To explain 'pretty dancing girls, the favourites of Harmodius,' is absurd. There is no reason to suppose that Harmodius was an admirer of dancing girls, and τὰ φίλταθ' Ἀρμοδίου could not mean 'such as H. would have loved.' The song is designated by a few words of its first line, just as we would say, 'The heart bow'd down,' or, 'The Harp that once,' or, 'Believe me, if all.' So Persius calls the Aeneid *Arma virum*; and Cicero calls even his prose treatises by the first words, referring to the *De Senectute* under the words *O Tite*. As many words of the *σκολιόν* as will fit into the metre are used to designate the song. Cicero, in a letter, thinks *Granius autem* enough to indicate the maxim put into the mouth of Granius by Lucilius :—

Granius autem,

Non contemnere se et reges odisse superbos.

For καλὸς ἐς, 'good at a thing,' see L. S. under καλός II. The words φίλταθ' Ἀρμόδι' οὐ τί πω τεθνηκας were the *beginning* of the *σκολιόν*. See Schol. on 977 : ἐν ταῖς τῶν πότων συνόδοις ᾗδόν τι μέλος Ἀρμοδίου καλούμενον, οὗ ἡ ἀρχή,

φίλτατε Ἀρμόδιε οὐ τι πω τέθνηκας. Cp. Ach. 1058, Vesp. 1226, Lys. 633, Pelarg. Fr. 3.

It might be urged in objection to this suggestion that σκολιά were sung by the guests, not by the ὀρχηστρίδες. This, no doubt, was the usual practice; but does it seem improbable that ὀρχηστρίδες would add to their art of dancing the faculty to sing for the company a popular catch?

I find that this suggestion, which occurred to me last midsummer, has been to some extent anticipated by Bergk in his last edition of the Greek lyric poets, which I have just seen. He suggests—

ὀρχηστρίδες, τὸ 'φίλταθ' Ἀρμόδι' οὐ τί πον'

This conjecture involves the same principle as mine, but presupposes a much greater corruption in the text.

1149:—

Ἀντιμάχον τὸν ξυγγραφῇ τῶν μελέων ποιήτην.

For ξυγγραφῇ, which violates the metre, I would read ζαγραφῇ, 'voluminous,' a word not found, but formed on the analogy of ζαφλεγής, ζατρεφής, ζαμενής. The Schol. tells us there was another Antimachus, who was a prose writer. Hence arose the corrupt ξυγγραφῇ.

DEMOSTHENES.

καὶ γὰρ ἅπασιν τούτοις οἷς ἂν τις μέγαν αὐτὸν ἡγήσαιο, τοῖς πολέμοις καὶ ταῖς στρατείαις, ἔτ' ἐπισφαλεστέραν αὐτὴν [i.e. τὴν Μακεδονικὴν δύναμιν], ἣ ὑπῆρχε φύσει, κατεσκεύακεν ἑαυτῷ. Dem. 22 (*Olynth.* 2).

Is it natural, or even possible, for a prose author to write οἷς ἂν τις μέγαν αὐτὸν ἡγήσαιο in the sense of 'by

which (i. e. by reason of which) one would suppose him great'? We meet in Sophocles, O. T. 441,

τοιαῦτ' ἐνείδιζ' οἷς ἔμ' εὐρησεις μέγαν,

but a phrase may be quite possible in a Greek poet, and well nigh impossible in Demosthenes. For μέγαν I would read μεγάλην, understanding κατεσκευακέναι after ἡγήσαιοτο. The meaning would be, 'by all those wars, by which one might suppose that he had aggrandized Macedon, he has really weakened her.'

EURIPIDES—*Med.* 909.

εἰκὸς γὰρ ὀργὰς θῆλυ ποιεῖσθαι γένος
γάμους παρεμπολῶντος ἀλλοίους πόσει.

I think it is probable that Eur. wrote,

γάμους παρεμπολῶντας ἀλλοίους πόσεις.

The phrase ὀργήν ποιεῖσθαι means 'to be angry'; and one of the commonest idioms in the Greek language treats such a phrase as a single verb, and makes it govern an object. Thus, ὀργὰς ποιεῖσθαι governed πόσεις, with which παρεμπολῶντας agreed. But an early copyist, not seeing the construction, changed πόσεις to πόσει, or possibly the *ς* at the end of the verse was obliterated, and was omitted through inadvertence. Then followed the change to παρεμπολῶντος, which seemed to give a possible construction, the genitive being regarded as absolute. The only real objection to the word ἀλλοῖος is, that it does not occur elsewhere in the tragic or comic poets. But this must be true of many words in each of the poets. The genitive παρεμπολῶντος can hardly be justified, standing where it does in the sentence. I do not see in what respect ἀλλοῖος

is unsatisfactory in meaning. The thought that the new bride was a Greek adds a sting to the ire of Medea.

It was a *different* marriage that Jason wished to contract; so Medea says (591):—

οὐ τοῦτό σ' εἶχεν, ἀλλὰ βάρβαρον λέχος
πρὸς γῆρας οὐκ εὐδοξον ἐξέβαινέ σοι.

Bacch. 451.

μαίνεσθε· χειρῶν τοῦδ' (= ἐμοῦ, *schol.*) ἐν ἄρκυσιν γὰρ ὦν.

In support of this way of arranging the passage, I would quote a very parallel expression to χειρῶν ἐν ἄρκυσιν from *Alcestis*, 985 :

καί σ' ἐν ἀφύκτοισι χειρῶν εἴλε θεὰ δεσμοῖς.

CRATINUS—*Cleobulinae* III. (Meineke, ii. 69).

ἔστιν ἄκμων καὶ σφῦρα νεανία εὐτριχι πῶλψ.

I cannot help thinking that, when ἄκμων and σφῦρα are coupled together in a proverb, the allusion *must be* to 'that which is smitten and that which smites.' Otherwise there is no force or point in the choice of these two objects; indeed one would rather expect other implements to be coupled together: δίκηλλα καὶ μάκελλα would make a more natural proverb.

I propose to read—

εἰσὶν ἄκμων καὶ σφῦρα νεανίαί εὐτριχι πῶλψ.

The meaning is 'to a long-haired lass lads are anvil or hammer, *i.e.* 'when a lad and a pretty maid come together, he is to her either anvil or hammer.' The meaning of this proverb would be, 'he is either the one who *suffers*, or the one who *inflicts*, the pangs of love.'

We have in English the proverbial expression, 'in love one is anvil or hammer,' and it seems not unlikely that the same ingenious conceit survives in this fragment. The French saw 'l'un baise, l'autre tend la joue' conveys a somewhat similar sentiment.

As regards the phraseology, it is true that Homer applies εὔθριξ only to horses; but Eubulus in the *Stephanopolides* II. (Mein. iii. 251) uses εὐτριχα of a man; πῶλος, of course, often means 'a girl': we find πῶλους Κύπριδος ἐξησκημένας in the same Eubulus in the *Pannychis* (Mein. iii. 245). But even were this not so, it would be quite within the license of a comic poet to speak of 'a long-haired girl' as 'a well-maned filly.' Moreover, in dealing with a fragment, especially a comic fragment, one must remember that an expression which by itself might seem strange might be more than justified by the context, if we had it. In reading νεανίαι for νεανία, it will be observed that I make *no* change; the words would be identical in capitals. The use of καί, where in English we would rather write 'or,' is familiar in Greek. The literal rendering would be, 'lads are (sometimes) the anvil *and* (sometimes) the hammer.'

ROBERT Y. TYRRELL.

NOTES ON LATIN LEXICOGRAPHY.

II.—ON THE PROSODY OF SOME LATIN WORDS.

1. *Acheruns*, *Acherunticus*. Lewis and Short on these words do not notice what it is important to observe, viz., that Plautus makes the *a* in them long. Thus *Capt.* 5, 4, 2 :

Crúciamenta : vérum enim vero núlla adaeque est Ácheruns ;
and *Bacch.* 2, 2, 21 :

Regiónes colere mávellem Acherúnticas.

2. *Acroama*, *acroasis*, and all the connected words are marked by L. and S. as having the first *a* long. But it is surely doubtful, the *a* in Greek being naturally short. Cf. Arist. *Av.* 1228 :

ἀκροατέον ὑμῖν ἐν μέρει τῶν κρειττόνων.

3. *Aculeus* and *Aculeatus* are marked by L. and S. as having the *u* long. It is really short.

The former word occurs in Plaut. *Trin.* 4, 2, 158 :

Iam dúdum meum ille péctus pungit aculeus,

a line which is not decisive as to the quantity. But *aculeatus* is found in Pl. *Bacch.* 1, 1, 30 :

Éadem in usu atque úbi periculum fácias aculeáta sunt,

which shows the *u* to be short. It is true that in Mart. 8, 71, 10, used to stand the line

Nonus aculeolos in cochleare tulit ;

but, as is remarked *s. v.* by L. and S. themselves, *acu*

levius vix cochleare is now read. In *eculeus* (*equuleus*) also, a formation parallel to *aculeus*, the *u* is short; thus in a quotation in Cic. *Tusc.* 28, 67 :

Essét dolendi caúsa ut iniecto éculei.

L. and S. rightly mark it *ecûleus*.

4. *Adorior*. On this word L. and S. strangely say, 'Forms analogous to *orëris*, *oritur* of the simple verb occur in Lucr. 3. 513; Lucil. *ap. Prisc.* p. 880 P.' But it is *adoritur* which occurs in Lucr. 3. 513 :

Commutare animum quicumque adoritur et infit;

and the line of Lucilius referred to (if it be, indeed, his—see L. Müller's *Lucilius*, p. 207) is as follows:—

Conturbare animum potis est quicumque adoritur.

5. *Affcticius* (and, I may add, *collecticius* and *faeneraticius*) is by L. and S. marked -*icius*. It ought to be -*icius*: see Part I. of these Notes, p. 310 of the present volume.

6. *Alcedonia* is marked by L. and S. as having the *o* long; but this is inconsistent with the fact, as stated by them, that *alcedo* has for its gen. *alcedinís*.

7. *Aliquotfariam* is marked -*fāriam* in L. and S. But they rightly mark *bifāriam*, *trifāriam*, and *multifāriam*; and they ought also to have given *aliquotfāriam*. The quantity of all these words must be the same, and is fixed by Plaut. *Aul.* 2, 4, 3 :

Ut díspartirem opsónium hic bifāriam.

8. *Allatro* is marked by L. and S. *allätro*, which implies that the *a* is radically short; but *latro* and *oblatro* are rightly marked as having the *a* long.

9. *Diuturnus* is in some Dictionaries, as, *ex. gr.* in White and Riddle, marked *diüturnus*, and there is no indication that the *u* is ever short. But it is well known,

and is mentioned by L. and S., that Ovid makes the word *diūturnus*. Thus in *Tr.* 4, 6, 50, we have

Haec fore morte mea non diuturna mala ;

and *ib.* 5, 20 :

Consummetque annos, sed diuturna, suos.

In *Fast.* 6, 352, again, we read :

Fecerat obsidio jam diuturna famem.

In such a line as *Fast.* 6, 219 :

Est mihi, sitque, precor, nostris diuturnior annis,

we might treat *diuturnior* as a quadrisyllable (*dyū-t.*); but we cannot do this with *diuturna* in the second half of a Pentameter line. Anomalous as the short *u* may appear beside *diū* and *diūtinus*, we must accept the facts, and as *diūturnus*, though it could easily be introduced into several sorts of metre, does not seem to occur anywhere in verse, I think a Lexicographer would do right in simply marking the word as *diūturnus*.

10. *Elephantiasis*. This word is marked -*āsīs* in L. and S., yet the corresponding Greek word is correctly marked *ἐλεφαντίασις* by Liddell and Scott. *Κριθιασις*, *ψωρίασις*, *ὕδεριασις*, and the whole set of similar words denoting morbid affections, and derived from verbs in -*aw*, have the penult. long.

11. *Funginus* is marked short (-*Ino*) by L. and S. But it is really long, as is shown by the line to which they refer, *Pl. Trin.* 4, 2, 9 :

Pól hic quidem fungíno generest ; cápíte se totúm tegit.

12. *Glandionida* is marked -*ōnida* by L. and S.; but *Pl. Men.* 1, 3, 27—

Glándionidám suillam aut lárídum pernónidem—

shows that the *o* is long.

13. *Hic* (as Mr. J. I. Beare¹ has remarked to me) is marked as long by L. and S., but it is sometimes short. Mr. Beare refers to *Lucr.* 4, 922, and 6, 9; and I may add the familiar

Hic vir, hic est, tibi quem promitti saepius audis
of Virgil, *Aen.* 6, 791.

14. *Labellum*, 'a small water-vessel, a tub, bathing-tub,' is marked with the *a* short in L. and S.; but it is the dimin. of *labrum*, 'a basin, a tub,' which they rightly mark *lābrum*, deriving it from *lavābrum*. This *labellum* then (for there is another) must have *ā* long. It is true that in *Cat.* 55, 4, in some of the older editions,

Te in circo, te in omnibus labellis

was read, and the Delphin editor tells us that *labellis* was interpreted as equivalent to *thermis*; but, as we have shown, that explanation cannot stand; and in fact in all the critical editions *libellis* is now read.

15. *Luscinia*. On *Hor. S.* 2, 3, 245:

Luscinias soliti impenso prandere coemptas:

Mr. Maclean (following *Comment. Cruq.*) says of *Luscinias*—'The second syllable is long; the third coalesces with the last.' But he adds nothing in proof of this assertion, which appears to be incorrect.

In *Phaedr.* 3, 18, 2, and 3, 18, 11, we read

Cantus luscini quod sibi non tribuerit,

and

Tibi forma, vires aquilae, luscinió melos.

In the first line the *i* may as well be short as long: there is no reason in the second, any more than in that quoted

¹ Mr. Beare observes that L. and S. 32, 5; *lālisio*, v. id. 13, 97; and *tegeti-* give *Lāronia* for *Lāronia*, v. *Mart.* 2, *cula*, v. id. 9, 92, 3.

from Horace, for supposing that the word should be regarded as a trisyllable (luscīn-yo).

Lusciniola occurs in Plaut. *Bacch.* 1, 1, 4 :

Pól ego metuo lúsciniolae né defuerit cántio,

where either quantity of the *i* will serve.

It is hard to believe that *lusciniā* does not contain the root of *cano*, whatever be the origin of the first part of the word, whether the meaning of the name be 'loud singer,' or 'singer of the gloaming.'

16. *Natrix* is marked *nātrix* in L. and S., though they derive it from *nāre*. This is, of course, wrong; the etymology, if correct, as is commonly assumed, fixes the word to be always *nātrix*. But it is to be observed that in the only poetical example cited, Lucil. 2, 21—

Si natibus natricem impressit crassam et capitatam—

the word is *nātrīcem*, and L. Müller, on this passage, denies the derivation from *nare*.

17. *Necubi* and *necunde* are marked *nēcubi* and *nēcunde* in L. and S. But this is wrong. The quantity of the second follows that of the first, and that *nēcubi* is right appears from Lucan, 9, 1058, a line which begins

Necubi suppressus pereat gener ?

See Heinsius' note on Virg. *Georg.* 3, 176, where in a good MS. *necubi* is found for *nec tibi*. Without any actual example to show the quantity of *e* in *necubi*, it is plain that (being, as it is, = *ne-quo-bi*) that word must follow the analogy of *nēquis*; cf. *si-cubi*.

18. *Nevolo* (= nolo) and *nevis* (= non vis) are in L. and S. marked as having *e* long; but in the three verses of Plautus to which they refer for *nevis*, viz. *Trin.* 5, 2, 32; *Most.* 3, 2, 75; and *Poen.* 5, 2, 119: and in the two, viz. *Trin.* 2, 2, 80, and *Most.* 1, 2, 29, which they cite for *nevolt*, the

words can only be *něvis* and *něvolt*, as, on the analogy of *něqueo*, they surely ought to be.

19. *Paeonius*. The *o* in this word is in L. and S. marked as long; but, though the corresponding post-Homeric Greek epithet is Παιώνιος, the Latin word is *Paeōnius*. The Latin references which L. and S., in common with other Dictionaries, give for its use are: 'Virg. *Aen.* 7, 769; Ov. *M.* 15, 535; Sil. 14, 27; Claud. *de Apon.* 67; id. *B. Get.* 121.' In every one of these places, as in others in Virgil and Claudian, which they do not quote, the word has the *o* short. It is true that in Virg. *Aen.* 7, 769, which in ordinary texts appears as follows:—

Paeoniis revocatum herbis et amore Dianae,

Heyne reads *Paeonīs*, and has a note on the line, in which he explains that the adj. formed from Παιών, gen. Παιώνος, must be Παιώνιος, whereas Παιόνιος 'ad Παλονας Thraciae et Macedoniae spectat.' Hence he infers we must read *PaeonIs*, or at least take *Paeoniis* (*Paeon-yis*) as a trisyllable. But when he comes to *Aen.* 12, 401—

Paeonium in morem senior succinctus amictu—

after referring to his comment on the passage in the Seventh Book, he adds 'At h. l. haeremus. An *Paeonjum* trisyllabum?' He evidently distrusted his former conclusion. Bearing in mind that the nom. *Paeōnius*, which *might* occur in a hexameter line, is never found, and that the Homeric form of the word Παιών is Παιήων, gen. Παιήονος, whence the adj. Παιήόνιος would be formed (which is, in fact, found in the Anthology), we may, I think, very well leave *Paeōnius* unquestioned.

20. *Pistrix* is represented in L. and S. as making *-icis* in the genitive. But in Cic. *Arat.* 152, we read

Flumine mixta retro ad Pistricis terga reverti.

The word, therefore, is *Pistricis*.

21. *Praestigiae* (which some write *praestrig.*) and the kindred words are by L. and S. marked as doubtful (*stīg*); but the *i* seems to be always long. The metrical passages quoted by L. and S. are the following :—

Pl. *Capl.* 3, 3, 9 :

Opérta quae fuére aperta súnť, patent praestígiae.

Caecil. apud Cic. *de N. D.* :

Praestígias praestrínxit commoditás patris.

Pl. *Poen.* 5, 3, 6 :

Praestígiator híc quidem Poenús probust.

Prud. *Cath.* 6, 41 :

Praestígiator ástu.

Peristeph. 2, 86 :

Suadéndo quos praestígíis.

Pl. *Truc.* 1, 2, 37 :

Nunc múlíer factast éx viro. Mala és praestigiátrix.

Id. *Am.* 2, 2, 150 :

Aút pol haec praestígíatrix múlto mulier máxumast.

In all these passages the word has the *i* long. There only remains

Pl. *Aul.* 4, 4, 2 :

Ego edepol te praestígiator miseris jam accipiam modis.

Here the *i* would seem to be short; but can there be a doubt, after the array of authorities we have seen, that Müller, Ussing, and the editors of the new Ritschl, are right in changing *edepol* to *pol*?

22. *Protervus*, *Proterve*, are by L. and S., and in some other Dictionaries, marked short (*pröt*); and that is usually the quantity. In Horace and Ovid, who are rather fond

of the word, the *o* is always short. But in Plautus it is long. Thus in *Am.* 2, 2, 207 :

Aúdacem esse, cónfidenter pró se et protervé loqui.

In *Bacch.* 4, 3, 1 :

Pétulans, protervo íracundo ánimo, indomito, incógitato.

In *Ter. Hec.* 3, 5, 53 :

Esse áutem tu quoque próterve íracúndus es :

the rhythm seems to indicate that the *o* in *proterve* is long, and Fleckeisen marks metrically as above.

23. *Quadriduum* (or *quatriduum*) is marked by L. and S. *quatriduum* (*quadrid-*); but this cannot stand beside *bíduum* and *tríduum*, as they rightly mark these words. In the line they quote from Plautus, *Pers.* 1, 1, 37, the MSS. have

Quos continuo tibi reponam in hoc triduo aut quadriduo ;

but Ritschl is, without doubt, right in omitting *in*, and treating the verse as a Troch. Trim. Cat.

24. *Quotidianus* (*cottidianus*). The quantity *cottid.* is by L. and S. and others mentioned as occurring in Cat. 68, 139; but as the text is certainly corrupt in that place (v. Ellis *in loc.*), and the word ought not to appear there at all, this reference ought to disappear from our Latin Dictionaries.

25. *Scalpturio* (so given in L. and S.) seems certainly not to be the right word in the one place where it appears, Plaut. *Aul.* 3, 4, 8 :

úbi erat haec defóssa, occepit fbi scalpturire ángulis.

As Wagner there remarks, *scalpurrire* (cf. *ligurrio*, *scaturio*) is best supported by MS. authority; and *scalpturio* would be a desiderative, and ought to have *u* short, which would not suit the metre.

26. *Silo, silus*. Curiously L. and S., whilst they mark the latter of these words as having *i* short, make that vowel long in *silo* (at least in one place: where *silo* occurs in the Dictionary according to alphabetical order, it is marked *sīlo*). The two words must surely go together, and that *silo* has *i* long is proved by Plaut. *Rud.* 2, 2, 12 :

Recálvom ac siloném senem, statútum, ventriósum.

27. *Siriasis* and *trichiasis* are marked by L. and S. as having *a* short; but *σευρίασις* and *τριχίασις* certainly have the penult long: compare what has been said on *Elephantiasis*.

28. *Struix*. The gen. of this word is made *struicis* in L. and S. and in several other Dictionaries; but the true quantity is *-icis*. In Plaut. *Men.* 1, 1, 26, we read

Tantás struices cóncinnat patinárias,

where the metrical marks are as in the ed. of Ritschl, who says in his note, '*Et tantas* Bothius imperite.' The *et*, in fact, does not appear in the MSS., and was inserted by Bothe, apparently with the single view of making the penult of *struices* short. In Liv. 36 (Ribbeck, *Scen. Rom.* i. p. 4) we have

Quó Castalia pér struices sáxeas lapsu accidit,

which again shows that the *i* is long.

29. *Subsido*. On this word L. and S. strangely say, 'collateral form acc. to 2d. conj. *subsident*,' and refer to Lucan 1, 646. But in that line, which begins '*Subsidentque urbes*,' *subsident* is the *future* of the 3rd conj., and there is no irregularity.

30. *Tetricus*. L. and S. give the word as *taetricus*, and mention, as another form of it, *tétricus*; yet that the *e* is

naturally short appears from every example they cite. They refer to these passages of Martial:—

6, 70, 8:

Et quantum tetricae tulere febres ;

7, 80, 2 :

Temperat et tetricae conticuere tubae ;

4, 73, 6 :

Moverunt tetricas tam pia vita deas ;

7, 96, 4 :

Ruperunt tetricae cum mala pensa deae ;

11, 2, 7 :

Lectores tetrici, salebrosum ediscite Santram ;

and 12, 70, 4 :

Udorum tetricus censor et asper erat ;

where L. and S. actually print *taetricus*, which the metre will not endure. They also quote two passages from Ovid, viz. :—

Am. 3, 8, 68 :

At nunc exaequet tetricas licet illa Sabinas ;

and

A. A. 1, 721 :

Hoc aditu vidi tetricae data verba puellae.

In all these passages, as we see, the word is *tetricus*. I suppose the motive for marking it *tetricus*, and preferring the spelling *taetricus*, was to indicate an etymological connexion with *taeter*. But that is, I think, a very questionable *rapprochement*: the latter word means 'foul, hideous'; the former, 'stern, severe'; and these senses do not point to a common origin.

Abjūgo, *Cethēgus*, *emāceratus*, *ēmeticus*, *fortassē*, *gentili-cius*, and *lēvis* ('for *legvis*,' v. art. G), which are all found in

L. and S., must be errors of the Press, such as are inevitable in a work of such dimensions. When the Dictionary gives *vĭbro*, *vĭbrisso*, but *evĭbro*, *exvĭbrisso*; *expalpōnides*, but *Nummos-expalpōnides*; *petibilis*, but *expetibilis*; *cinerĭcius*, but *succinerĭcius*, the fault is more likely to lie with the writer than with the printer. It is to be regretted that this latest work of its class should, in the matter of prosody, be so little trustworthy.³

³ In my former Notes, *Herm.*, vol. iv. p. 310, I omitted to mention an example of *cumatilis*, which might be cited to show that the *a* is long. It is in Fragn. 114 of Titinius (Ribbeck, *Scen. Rom.* ii. p. 128)—

et quem colos cumatilis
Deceat.

Ribbeck regards the *a* as long in this place; but it is obvious that other arrangements of the words might be adopted, as, *ex. gr.*,

et quem colos
Cumatilis deceat,

which would restore to *cumatilis* what certainly seems its right quantity.

JOHN K. INGRAM.

NOTE.

CICERO, *Epp. ad Att.* IV. 2, 4.

Ille [Serranus] noctem sibi postulavit; non concedebant. Reminiscebantur enim Kal. Ianuar. Vix tandem TIBI de mea voluntate concessum est.

S. ATTILIUS SERRANUS had been active in opposing the restoration of Cicero. On the Kalends of January, being besought by his father-in-law, Gnaeus Oppius Cornicinus, to withdraw his veto, Serranus had asked for a night's reflection. This was granted, but he persevered in his opposition.

Again, on the occasion referred to in the passage on which I comment, the question of Cicero's indemnification being before the Senate, Serranus pronounced his veto on a resolution favourable to Cicero. Cornicinus 'reënnacted his old rôle,' and begged his son-in-law to withdraw his opposition. Again Serranus asked for a night. The Senate, mindful of Jan. 1, refused. But at last the concession was made, and with the consent of Cicero, the person interested in the passing of the resolution.

Such is the meaning of the passage. But TIBI is the reading of the Med. (corrected, by an obvious blunder, to *sibi*, a solecism, in M²). The edd., ancient and modern, for *tibi* read *illi*, or *id ei*, or *homini*. But how does *tibi* come to stand in M? Surely no copyist, however stupid, finding *illi*, or *id ei*, or *homini* (any of which words would give an easy sense), would have written *tibi*, which at first sight seems to give no sense at all.

But **TIBI** really admits of an excellent explanation. It is the *ethical dative*, which is found far more largely in Cicero than elsewhere, save only in the comic drama. I would render, 'After all, at last, *lo and behold you*, with my consent, the point was conceded.' The vigorous exclamation is quite justified by the *unexpected* announcement that Cicero himself was for conceding the request of Serranus, which was so adverse to his interests.

Cp. hic *tibi* rostra Cato advolat, Att. I. 14, 5; at ille *tibi* pergit Brundisium, VIII. 8, 2; alter *tibi* descendit de Palatio, Rosc. Am. 133; novem *tibi* orbibus conexas sunt omnia, Rep. VI. 17. Cp. also ecce *tibi* iv. Non. Febr. mane accepi litteras tuas, Att. VII. 19. If it be argued that here *tibi* might be confounded with the dative after *concessum est*, I would point to qui *mihi* accubantes in convivio, Catil. II. 10, where *mihi* is the ethical dative (see Draeger's *Historische Syntax*, vol. i. p. 433).

ROBERT Y. TYRRELL.

LUCRETII.

I. 950-1012.

Sed quoniam docui, solidissima materiai
 Corpora perpetuo volitare invicta per aevom ;
 Nunc age, summae quaedam sit finis eorum,
 Necne sit, evolvamus : item, quod inane repertum est,
 Seu locus ac spatium, res in quo quaeque gerantur,
 Pervideamus, utrum finitum funditus omne
 Constet, an immensum pateat vasteque profundum. 957

Omne quod est, igitur, nulla regione viarum
 Finitum est ; namque extremum debebat habere :
 Extremum porro nullius posse videtur
 Esse, nisi ultra sit quod finiat ; ut videatur,
 Quo non longius haec sensus natura sequatur.
 Nunc extra summam quoniam nihil esse fatendum est,
 Non habet extremum ; caret ergo fine modoque :
 Nec refert, quibus assistas regionibus eius :
 Usque adeo, quem quisque locum possedit, in omneis
 Tantundem parteis infinitum omne relinquit. 966

Praeterea, si iam finitum constituatur
 Omne, quod est, spatium, si quis procurrat ad oras
 Ultimus extremas, iaciatque volatile telum,
 Id validis utrum contortum viribus ire,
 Quo fuerit missum, mavis, longeque volare ;
 An prohibere aliquid censes obstareque posse ?
 Alterutrum fatearis enim sumasque, necesse est,
 Quorum utrumque tibi effugium praecludit, et omne
 Cogit ut exemta concedas fine patere.
 Nam sive est aliquid, quod prohibeat efficiatque,
 Quo minu', quo missum est, veniat, finique locet se ;

Sive foras fertur, non est a fine profectum.
 Hoc pacto sequar, atque, oras ubiquomque locaris
 Extremas, quaeram, quid telo denique fiat.
 Fiet, uti nusquam possit consistere finis;
 Effugiumque fugae prolatet copia semper. 983

Praeterea spatium summaï totius omne
 Undique si inclusum certis consisteret oris,
 Finitumque foret; iam copia materiaï
 Undique ponderibus solidis confluet ad imum;
 Nec res ulla geri sub caeli tegmine posset;
 Nec foret omnino caelum, neque lumina solis:
 Quippe ubi materies omnis cumulata iaceret
 Ex infinito iam tempore subsidendo.
 At nunc nimirum requies data principiorum
 Corporibus nulla est; quia nil est funditus imum,
 Quo quasi confluere, et sedeis ubi ponere possint;
 Semper in assiduo motu res quaeque geruntur
 Partibus in cunctis, infernaque suppeditantur,
 Ex infinito cita, corpora materiaï. 996

Postremo ante oculos res rem finire videtur:
 Aër dissaepit colleis, atque aëra montes;
 Terra mare, et contra mare terras terminat omneis:
 Omne quidem vero nihil est, quod finiat, extra.
 Est igitur natura loci spatiumque profundi,
 Quod neque clara suo percurrere flumina cursu
 Perpetuo possint aevi labentia tractu;
 Nec prorsum facere, ut restet minus ire, meando:
 Usque adeo passim patet ingens copia rebus,
 Finibus exemptis, in cunctas undique parteis.

THE old order, which Mr. Munro alters, is right:—
 In the first place, as Lucretius states it, the question is twofold: first, are the atoms infinite in amount? second, is space infinite in extent? (cf. Epicurus, *ap.* Diog. Laert. x. 41: καὶ μὴν καὶ τῷ πλήθει τῶν σωμάτων ἀπειρόν ἐστι τὸ πᾶν καὶ τῷ μεγέθει τοῦ κενοῦ).

From 957 to 966, Lucretius states the general propo-

sition, that any one thing is only bounded by some other thing.

This argument is applicable to both atoms and space.

From 967 to 983 is the special argument for the infinity of space, that any one point taken as the last is only a fresh starting-point, 'a new departure.'

This is the first argument for the infinity of space.

From 984 to 997 is an *ad absurdum* in favour of the infinity of space; and this is the second argument regarding space.

Lucretius then introduces the last or third argument by his usual *postremo*, and makes his usual short appeal to the senses (998-1001). This habit is pointed out by Mr. Munro himself in a note on 701-704, p. 381, 3rd ed.

II. 354-366.

At mater viridis saltus orbata peragrans
Liquit humi pedibus vestigia, etc.

Liquit is right: the mother leaves her mark everywhere. As to the phrase *linquere vestigia*, cf. *liquit primordia*, ii. 476; *relinquit vestigia*, iii. 308-309; *vestigia linqui*, *ib.* 320; and the whole passage shows that the cow is using her sense of *sight*, not *smell*:

Omnia *convisens oculis* loca si queat usquam
Conspicere (v. 357),

and v. 364:

Nec vitulorum aliae *species*;

but what is decisive is

quiddam proprium notumque requirit;

whereas, if we read '*noscit vestigia*,' she has already found proprium notumque.

In the parallel case of the kids, norunt is 'recognise': so if noscit is 'recognise,' why does not the cow track her calf to the altar in place of adsistens? Why revisit stabulum? Lucretius is arguing that every living thing has an individual appearance of its own,

Invenies tamen inter se differre *figuris*;
Nec ratione alia proles cognoscere matrem
Nec mater posset prolem,

and gives as a case in point the cow and her calf. 'Cognoscere matrem' is adopted by Virgil, *Ecl.* iv. 60.

II. 975.

genus humanum proprium de quibus auctum.

Lambinus, with the approval of Mr. Munro, says:— 'Primum Latine dici non potest *auctus de re* aut *ex re aliqua*, sed *auctus re aliqua*,' speaking of course (says Mr. Munro) of the atoms of which a thing is made (Munro, 3rd ed. p. 112).

I. We can certainly use *de* of the changed material out of which the change is effected:

Candida de nigris et de cudentibus atra
Qui facere adsuerat (Ov. *Met.* xi. 314);

and *de* may be used of the unchanged material:

solido de marmore templa (*Aen.* vi. 69).

As Epicurus recognises only two categories of Matter (τῶν σωμάτων τὰ μὲν ἐστὶ συγκρίσεις, τὰ δ' ἐξ ὧν αἱ συγκρίσεις, Diog. Laert. x. 40), and as the atoms have no properties πλὴν σχήματος καὶ βάρους καὶ μεγέθους καὶ ὅσα ἐξ ἀνάγκης σχήματι συμφυῇ ἐστὶν, *ib.* 54, Making and Growth are one and the same process.

II. With regard to the causal sense of *de*, so irritating to Lambinus and Mr. Munro, in the first place, the effect never precedes the cause; and, as the word *consequence* shows, the effect may be described as merely following the cause.

As to the Latin, cf. Ov. *Met.* iii. 260:

gravidamque dolet *de* semine magni
Esse Iovis Semelen;

Deque tuis lacrimis humida sarta dabo (*Trist.* III. iii. 82)

(quoted by Mr. Munro and compared with Tib. II. vi. 52: et madefacta meis sarta feram lacrimis); Stat. *Th.* iv. 72:

trunca vident de vulnere multo
Cornua.

III. *Ex* and *de* may be indifferently applied to the same instance:—Lucr. ii. 790–1:

ex albis quoniam non alba creantur
Nec, quae nigra cluent, *de* nigris, sed variis *de*.

CICERO, *Ad Quint.* II. xi.

‘Lucreti poemata, ut scribis, ita sunt, multis luminibus ingeni, multae tamen artis.’

So all MSS., and, thus punctuated, rightly. ‘The poetry of Lucretius is just as you write; it shows frequently great brilliancy of genius, and though the two are not often combined, much skill in composition.’

As for *tamen*, cf. Ter. *Ad.* I. ii. 30:

Alienior aetate post faceret tamen.

Frequently takes off the plural *luminibus* = there are

many purplei panni, and the whole shows much metrical and linguistic craft.

We must recollect the poor opinion Cicero and Lucretius had of Latin as a vehicle of Greek thought.

As for *artis*, cf. Hor. *Epist.* II. i. 59:—

vincit Terentius arte.

Horace opposes *ars* to *ingenium*:—

Ingenium misera quia fortunatius arte,

Ep. II. iii. 295; and to *natura* (*ib.* 408):—

Natura fieret carmen laudabile an arte.

Sub with the Accusative of Time.

Mr. Roby lays down that *sub* with the accusative of time means *after*. There are at least two passages in Horace where the nature of the case renders any meaning but *just before* ridiculous:

ut marinae

Filium dicunt Thetidis *sub* lacrimosa Trojae

Funera (C. I. viii.).

Tu secunda marmora

Locas *sub* ipsum funus (C. II. xviii.).

In Cicero we have

Senatus fuit frequentior quam putabamus esse posse mense Decembri sub dies festos (*ad Q.* II. ii.).

Happily Rome had no Irish to bring the Senate together in the recess.

Mr. Roby quotes only one passage, which at first blush makes for him:

Sub eas statim recitatae sunt tuae (*ad F.* X. 16).

Of course, from our point of view, *sub* here means after ; but in the Roman epistolary time *sub* is a point between the reading of the letter of Lepidus and the receipt of Cicero's letter by Plancus : that is to say, in the order of time we have, first, the letter of Lepidus read ; second, the letter of Plancus read ; and third, the notification of the first and second by Cicero to Plancus. So, in space, *sub* denotes a point between me and the object. For the passages in Horace I am indebted to Mr. R. F. T. Crook.

2 COR. XI. 25.

νυχθήμερον ἐν βυθῷ πεποίηκα.

'C'est un grand homme,' says Voltaire ; 'il jure qu'il a été un jour et une nuit au fond de la mer.' 'Ἐν βυθῷ may refer to the place of punishment beneath the waters, where the rebellious spirits were confined (see Delitzsch's notes on Job, ix. 13, xxvi. 12-13 : cf. Ed. Poe's 'Demons down under the Sea') ; but it is also classical :

τὸν ἐκ βυθοῦ κλωστήρα σώζοντες λίνου (AESCH. *Cho.* 500),

shows that the word βυθός does not involve of necessity *great depth* : in

τὴν πόλιν χρόνῳ ποτὲ
ἐξ οὐρίων δραμοῦσαν ἐς βυθὸν πεσεῖν,

Soph. *Aj.* 1081, 1082, ἐς βυθὸν πεσεῖν is opposed to *running fair* ; so that it may refer to the fact known to the reader of Thucydides, that an ancient ship did not go down, but lay water-logged till she went to pieces. Mr. Grote makes use of this in his argument in defence of the Athenians, when they condemned the six commanders for not taking off the survivors. As to the equivalence of

καταδύεσθαι το ἐς βυθὸν πεσεῖν, cf. πολλαὶ πόλεις, καθάπερ πλοῖα καταδυόμενα, διόλλυνται διὰ τὴν κυβερνητῶν καὶ ναυτῶν μοχθηρίαν.—Plat. *Polit.* 302 a.

ACTS, XXVI. 28.

ὁ δὲ Ἀγρίππας πρὸς τὸν Παῦλον ἔφη, ἐν ὀλίγῳ με πείθεις Χριστιανὸν γενέσθαι.

St. Paul had asked the King if he believed in the Prophets—that is, in the prophecies of a Messiah. The King replies : *That belief which I, like all Jews, have in the Prophets does not help you much in your effort to convert me to your views as to your alleged Messiah.* In no place is ἐν ὀλίγῳ used as equivalent to παρ' ὀλίγον; and in the next verse St. Paul repeats the phrase, καὶ ἐν ὀλίγῳ καὶ ἐν πολλῷ; that is, *not only in what you consider ὀλίγον—namely, belief in a Messiah—but also in what I hold all important—in THE Messiah.* The Revised Version takes ἐν ὀλίγῳ as cognate to πείθεις, *with but little persuasion*, while the American Committee vote for *in a short time*. If we connect the question with the answer, it is decisive in favour of *in a small point*. Alford properly points out that the Authorised Version *almost* is at variance with the second ἐν ὀλίγῳ.

JUVENAL.

I. 157.

Et latum media sulcum deducis arena.

I offer as a possibility : sulcum deducis = deducis sul-

cum luminis; Juvenal perhaps compressed into *sulcum deducis* Vergil's

Stella facem ducens
 sulcus
 Dat lucem,

Aen. ii. 694-698; cf. Lucan, v. 561-2:

traxere cadentia sulcos
 Sidera;

ib. x. 502:

solet aetherio decurrere sulco
 Trabs;

Sil. It. i. 353-7:

sulcatum tremula secat aera flamma;

ib. xv. 1210-11:

ferri inter nubila visus
 Anguis et ardenti radiare per aera sulco;

Val. Flac. i. 568:

ingenti flammanthem nubila sulco
 facem.

As to *duco*, cf. Lucret. iv. 140:

umbram ducere late;

Aen. v. 528:

crinemque volantia sidera ducunt;

Lucr. ii. 207:

flammarum ducere tractus.

IV. 112.

Marmorea meditatus proelia villa.

An imitation of Lucan (v. 479-480):—

Ductor erat cunctis audax Antonius armis
 Iam tum civili meditatus Leucada bello.

Marmorea is 'rich'; cf. *Sat.* vii. 79-80:

Marmoreis Lucanus in hortis.

IV. 128.

Erectas in terga sudes.

The common rendering 'on the back' must be wrong; that would be *tergo* or *in tergo*, *tergis* or *in tergis*.

I formerly took this as 'Don't you see his fins bristling in ridges?' *in* (ἐν) denoting the last phase of the action; cf. Mart. II. xi. 6:

qui Mentora frangis
In scaphium;

Lucan, iii. 17:

In multas laxantur Tartara poenas;

Lucret., vi. 399:

Nec parcit in hostes,

i. e. and does not reserve them for a future occasion against his enemies.

In c. acc. = 'on the back' is not justified by *in faciem* (Juv. iii. 280), *in terram* (Lucr. i. 889), *in latus* (Ov. *Fast.* IV. vi. 64); for in all these cases the acc. points to the result of the motion.

As to *terga* signifying 'serrated ridge,' cf. Verg. *Georg.* i. 97,

quae suscitât aequore terga;

Lucan, v. 564-5,

niger inficit horror
Terga maris.

But I now agree with Professor Brady, who takes *terga* to mean the two sides of the fish, and this he illustrates by *duplex spina* (Verg. *Georg.* iii. 87). I have since found an exact parallel which proves his point:

Cornibus aeriis atque in sua terga recurvis (Ov. *Fast.* v. 119).

Here *terga* is obviously the two sides of Capricorn.

V. 155.

Discit ab hirsuta jaculum torquere capella.

The gender of *hirsuta* seems decisive in favour of the literal sense of *capella*, as in proper names the real sex and not the gender is followed, as in Greek neuter names of women. Nor, independent of Mr. Lewis's parallel, is *ab* indefensible, as it is taken in close connexion with *torquere*; *ex equo* is simply 'mounted'; *ab equo torquere* is 'to shoot as a man must when on a horse.'

X. 365-6.

Nullum numen habes, si sit prudentia, sed te
Nos facimus, Fortuna, deam, caeloque locamus.

The sense is all in favour of *habes*: foresight eliminates chance.

Numen is power, influence, and not miraculous assistance. How can foresight secure divine aid?

The sentiment is taken from Democritus, who is introduced in this satire as laughing at fortune (52-3):

cum Fortunae ipse minaci
Mandaret laqueum mediumque ostenderet unguem:

ἄνθρωποι τύχης εἰδωλον ἐπλάσαντο πρόφασιν ἰδίης ἀβουλίας· βαιὰ
γὰρ φρόνησι τύχη μάχεται, τὰ δὲ πλεῖστα ἐν βίῳ ψυχὴ εὐξύνετος ὁξυτερ-
κείειν κατιθύνει—Eth. Fr. 14, ed. Mullach.

T. MAGUIRE.

SYMPOSIACA.

HOMER, *Il.* I.—VI.

IT has been mentioned to me, as a matter for some small regret, that a little more was not said, in the First Number of *Hermathena*, about the change proposed in Homer, *Ceres*, 229 :—

οἶδα γὰρ ἀντίτομον μέγα φέρτερον ὑλοτόμοιο,

with respect to which the help given in L. and S. was ‘*ὑλότομος* : a plant cut in the wood, used as a charm,’ and with respect to *ὑποταμνόν* : ‘a plant cut off at bottom for magic purposes : *dub*.’

I suggested that *οὐλοτόμοιο* was the true reading, in the sense of ‘gum-cutting,’ or ‘cutting teeth,’ as we say; and that *ὑποταμνόν* means ‘the cutting upward of the young tooth through the gums.’ Then Demeter will say to Metaneira, of the babe Demophoön, v. 227–230 : ‘I will nurse him; and I do not expect that, through some misconduct of his nurse, any convulsive fit will hurt him, nor any cutting of the teeth; for I know a remedy very superior (to those usually employed) in the case of teething, and also an excellent preventive of the very painful convulsive fit.’

It seems strange that it should be possible to make an incontrovertible emendation even in ‘the book of Homer’—the object of so much loving criticism through so many generations. Except during ‘the Dark Ages,’ it has been the book most read for entertainment and profit by all the cleverest and best-informed men who lived in a period of

more than 2500 years. In 'the Dark Ages' ambitious people were taken up with a struggle for or against some kind of religious supremacy, and the literary men with patristic and Papal theology. The early Christian bishops had also put quite out of sight, and nearly exterminated, all Greek literature except their own, and such portions of the old as might be made to seem to be consistent with it. Of the latter was Plato, especially, and even Aristotle; but they succeeded in destroying utterly Archilochus, Mimnermus, Ibycus, Alcaeus, Sappho, Anacreon, Philemon, Menander, Antimachus, and many more, whose beautiful works have not been replaced by anything that deserves mention in comparison. The Greeks themselves almost thought that they ought to place Archilochus and Antimachus on the same level of excellence as Homer. One hundred and five plays of Menander alone—whom I regard as superior to all other writers of plays not tragic (for you cannot call his plays 'comedies' in the modern sense)—were thus extinguished for ever. Meineke calls it '*impia Byzantinorum imperatorum pietas*,' and refers you to '*Petrus Alcyonius de Exilio*, I. p. 69:—*se puerum ex Demetrio Chalcondyla audivisse narrat, sacerdotes Graecos hoc a Caesaribus impetrasse ut Menandri, Philemonis, Sapphus, Mimnermi, Alcaei, aliorumque poetarum carmina comburerentur; eorumque in locum Gregorii Nazianzeni carmina* (see, if you like, Anth. Pal. ed. Jac. VIII. pp. 539–604, and the Χριστιανῶν Ἐπιγράμματα, I. pp. 3–34) *substituerentur. Ipsa Alcyonii verba vide apud Fabric. B. G. II. p. 460.*'

With only such Greek poetry to read as that indicated above, in the brackets, it is no wonder that there was no great reading of Greek poetry in 'the Dark Ages,' and so Dante, 'the first great writer of the first modern language,' seems to have known no Greek, not even the 'Gregorian Epigrams.' Petrarch's biographer, Campbell, says he,

Dante, did not even know the Greek alphabet, vol. i. p. 233. Otherwise the cleverest and best-informed men in all those generations seem to have been quite as much occupied about Homer as about anything else. Those who wrote, and whose works have been allowed to come down to us, are always quoting his verses as something impressive and authoritative beyond any other influence: they have him off by heart, and their souls are full of him. It is the merest ignorance to think or say that Aristotle and Greek gentlemen of his time were not critical readers of Homer, in the best and highest sense of the word 'critical.' Aristotle makes few remarks of a destructive or disparaging character about the text, and is like Epicurus, who did not much interfere with the popular belief about gods. A similar reason accounts for each paralogy. It was no use trying to dethrone the Homer of Aristotle's day: it was no use trying to dethrone the gods of Epicurus's day; and so he left them well enthroned at a very safe distance. See Cic. *N. D.* I. 44. 123: '*Posidonius disseruit . . . quae (Epicurus) de diis immortalibus dixerit, invidiae detestandae gratia dixisse.*' They did not wish to be torn in pieces by the rabble: why should they?

From as early as there is any trace, the wisest Greeks were devoted readers and critics of Homer, and not in any flippant and puny manner, but with correct observation and real capacity. So you find a critical selection of Homeric forms and phrases adapted to other kinds of poetry in such fragments of the 8th, 7th, and 6th centuries B. C., as have escaped the ghastly wreck and wreckers. There is nothing in any literature as charming and soul-fascinating as those fragments are. Solon prayed he might not die till he had learned the odes of Sappho off by heart. But a critical axiom of Anaxagoras, whose teaching influenced so greatly Pericles, Socrates, and Euri-

pides, is worthy of repeated notice: δοκεῖ δὲ πρῶτος τὴν Ὅμηρον ποιῆσιν ἀποφάνασθαι εἶναι περὶ ἀρετῆς καὶ δικαιοσύνης, Diog. L. 1. 3. 7: 'He seems to have been the first to declare that Homer's poetry is all about virtue and uprightness.' This is exactly what Horace says, *Epist.* 1. 2. 3, and Grote denies in a very unaccountable manner. But there are persons who can take in nothing unless the sermon is preached at them out to the bitter end, in the disgusting fashion adopted by Xenophon, *Historiæ Græcæ*, by Polybius, and, I regret to say, by Strabo. They never leave the account to tell its own story: they leave no opportunity unaccepted of launching at you the whole sackful of didactic reflexions; as if there was no chance of their readers possessing any sense. Homer and Virgil are not like that: they knew that people object to be lectured, and to have it assumed that they are both very stupid and very wicked. Their teaching is conveyed entirely 'between the lines,' and one feels that the writers were not only the most highly gifted, but also the most polite and amiable of men. That aesthetic remark of Anaxagoras is of singular value, and ought to apply to all poetry which is intended to please.

Not to be too particular in small space, it may be well to pass on to Aeschylus, τὸν τραγικόν, as they called him, and 'that old demi-god who hit the mark in everything he wrote,' Satyric Drama and Tragedy alike (Anth. Pal. VII. 411). Aeschylus was plainly of the same opinion as Anaxagoras. His *Eumenides* is the most *foudroyant* and deterrent sermon that was ever preached against sin; yet he says of it in a passage which, in this preliminary gossip about Homer, I will translate throughout, Atnen. 8. 39: '. . . the words of the beautiful and illustrious poet Aeschylus, who said that his tragedies were only slices from Homer's grand banquets. Aeschylus was a philosopher of the very highest rank; who, when he was on one

occasion unjustly adjudged not to have won the first prize, said, "I dedicate my tragedies to Time, and I know that I shall reap the honour they deserve." "

It is not necessary to say more about Aristotle; and of Aristarchus I will only record once more what is said, Athen. 14. 34, how that Panaetius, the Rhodian philosopher and friend of Scipio Aemilianus, gave him the name Μάντις, 'the diviner, because he readily made out, as by inspiration, the meaning of obscure verses.' As compared with Aristotle, Aristarchus had the great advantage of living under the protection of a literary monarch who had absolute power, and no fear of any bigoted Athenian democracy. This partly applies also to Plutarch, for the Roman imperial rule was gracious and tolerant, except when fanatics disturbed the public peace in an aggressive way, for their own ends, and without provocation. Plutarch's 'Homeric Studies' seem to me to be remarkably good and excellent. He was like Sosibius (contemporary with Callimachus, 260-240, B. C.), wonderfully clever at solving critical difficulties, θαυμάσιος λυτικός, Athen. 11. 85, a λυτικός being opposed to ἐνστατικός, 'a propounder of difficulties.' Thus in Hom. *Od.* 14. 39:— 'and all at once the mightily-barking dogs caught sight of Ulysses, and, giving tongue, they ran at him; but Ulysses knowingly sat down, and his staff dropped from his hand,' the question propounded is: 'Why was Ulysses so shrewd and politic in sitting down and dropping his stick?' The dogs were probably a sort of big mastiffs of the Epirot or Molossian breed (Arist. *H. A.* 3. 16, says 'the biggest dogs are in Epirus,' and *ib.* 9. 1. 2, which requires to be pointed otherwise and to be emended slightly: I put the stop after προβάτοις instead of after ἄλλοις, and insert ἀλλὰ before τῷ μεγέθει: 'as for the breed of dogs in Molossia, with respect to cleverness in hunting game and following cattle, it is no better than what can

be found elsewhere; but it is superior in point of size and in courage to fight wild beasts'). De Quincey solves the question thus: 'He stooped to pick up a stone; dogs cannot bear being thrown at; and *κρᾶνα* Ithaca is a place where there is a plenty of stones lying about.' That is comical but not convincing. Plutarch's answer seems better, *de Soll. Anim.* 15: 'dogs never continue to fight with the prostrate and those who have submitted, provided their antagonists are of similar habits with themselves.' That is: dogs are omnivorous, like man, and there is no natural antipathy, *ἐχθρά*, but rather a *στέργηθρον* between dog and man. If Ulysses had been a rat, or a fox, or a cat, or a hare, it would have been different. The dogs of Eumaeus are satisfied as soon as he declares himself defeated, and when their work of guarding the kraal is done. But they kept an eye on him, and he *seemed* to be in danger until Eumaeus came.

It also seems to be a token of great critical care that every line was obelized in which the article, that was to be, appeared to be used as the Attic article and not as a pronoun of the third person.

The reverence felt for the 'book of Homer' was so great that I find only two places in which the profane and sacrilegious expression is used *ἐψεύσατο βίβλος Ὀμήρου*, 'the book of Homer is wrong.' One is Anth. Pal. xi. 356, Anon., where it is only said in jest. But Nonnus (ab. 600 A. D.), *Dionys.* 42, 164, is certainly wrong, where he uses the same form of *βλασφημία* and confounds *πόθος* with 'Αφροδίτη. Plato is the chief sceptic about Homer's unerring sagacity. His strictures seem to me to be invariably silly and impertinent. He did not appreciate Homer's practical wisdom, and the pertinence of everything he says to the various departments of human life. Homer would not have thought much of Plato. He would agree with Aristotle, who lost no time in writing a refuta-

tion of that omnium-gatherum of sophisms and of Greek words perversely used, the *Phaedo*; and would have approved of the famous verdict, Arist. *Anal. Post.* 1, 22, 8: *χαίρω τὰ εἶδη τερπίσματα γὰρ ἐσσι*, 'Adieu, ye idealities: ye are as sounding brass and a tinkling cymbal.' The later Greek word for 'Adieu!' was *σῶζεο, σῶζου*, Anth. Pal. v. 241 (Paulus Silentarius, ab. 530 A. D.), *σῶζοιο*, Ach. Tat. 6. 1—a meaning not given in L. and S.¹

It may be well to append to this preface a translation of some old ascriptions of praise to Homer, which seem not to be as well known as they might be with advantage. They are all anonymous. Some other very interesting epigrams on Homer may be found in Plutarch, *de Vit. et Poes. Hom.* 3.

Anth. Plan. 293: 'I do not clearly make out either his name or the place where he was born: O Gott im Himmel! I wonder if Homer has the glory of verses that you made yourself.' This is clever enough; for one hardly suspected Zeus of being able to make Greek verses like Homer, nor of playing chess like Morphy, nor billiards like Roberts, nor cricket like W. G.

Ibid. 300: 'To everlasting and from everlasting thou, O Homer, art the theme of praise.'

Ibid. 302: 'At last, and hardly, Nature found out the way to make him, and then ceased from her labours, having turned all her attention to the production of only one Homer.' This is the source of Dryden's famous and fulsome epigram beginning 'Three poets in three distant ages born.'

Ibid. 304: 'While telling the story of a city that was burnt by its captors, you make all those cities jealous that have not been sacked.'

I quote one more because of its importance, and also

¹ It is given in the new ed.—Ed. HERM.

for the purpose of recording my opinion that it was written by Simonides, the nonpareil and prince-paramount poet of epigrams. Naturalised at Athens, and living for nearly twenty years with Hipparchus, he might very well identify himself with the Athenian people. The Greek of the epigram is too pure, concise, and forcible to be written by any one but Simonides. (I think the Alexandrine critics struck his name off it because he was born in the island of Ceos, and wrote the epigram about Hipparchus which follows, App. Epigr. 78 :—

ἡ μέγ' Ἀθηναίοισι φόως γένεθ' ἡνίκ' Ἀριστο-
γείτων Ἰππαρχον κτείνε καὶ Ἀρμόδιος—

the absent are always wrong, and, besides, I cannot imagine that Simonides could fail to sympathise with the inauguration of that era of heroism and freedom, the praises of which he lived to express in epigrams of unparalleled elegance.) Anth. Pal. 11. 442 :—‘When I had thrice made myself supreme, the people of Erechtheus thrice drove me out, and thrice brought me back ; me, the great councillor Peisistratus : who also collected “the book of Homer” which was sung before in detached portions : for that “unvalued” poet was a countryman of ours, if, as indeed we did, we Athenians colonised Smyrna.’

By means of *Il.* i. 434 ἰσθὺν δ' ἰστοδόκῃ πέλασαν and *v.* 480, οἱ δ' ἰσθὺν στήσαντο, I explain Eur. *Troad.* 1147-1 :—

ἡμεῖς μὲν οὖν, ὅταν σὺ κοσμήσῃς νέκυν,
γῆν τῷδ' ἐπαμπισχόντες ἀρούμεν δόρυ,

where ἀρούμεν δόρυ means ‘we will hoist the mast.’ Hesychius explains δόρυ by πᾶν ξύλον ἢ δοκόν. Seneca’s way of translating it, *Troades*, III. 763 and 817, is ‘*ancoras classis*

legit': and '*Abripite propere classis Argolicae moram.*' It may be inferred that he did not know that δόρυ meant 'the stick' or 'mast' of the ship.

In that Book 'of venerable antiquity,' as some one says, the Second of the Iliad, it seems to me that οὔλος "Ονειρος, vv. 6 and 8, is adequately explained as 'whole and undivided,' a dream that was complete in itself and not interrupted by heterogeneous dream-fancies. This will be neither 'pernicious,' Butt., nor 'mischievous,' Grote, nor 'manifest,' etc., etc. I would suggest the translation 'one and the same' for the two passages where the word occurs: thus v. 6, 'to send to Atrides Agamemnon a One and the Same Dream,' and v. 8, 'come, go, thou One and the Same Dream.'

There is no possibility, in my opinion, of ἄγονος³ meaning anything else but 'without children' in *Il.* III. 40:—

εἴθ' ὄφελος ἄγονός τ' ἔμειναι, ἀγαμός τ' ἀπολέσθαι.

Hector says: 'you are a person who ought to have no children, and I wish you may not.' It is a common form of curse upon a coward, not fit to be the father of children. ἄγονος *nowhere* means 'unborn.'³ In Eur. *Phoen.* 1597, it means 'not fit to be born,' as the Scholiast rightly explains: ἀντὶ τοῦ, μὴ πρέποντα εἶναι τεχθῆναι. In *Il.* IX. 455, the father of Phoenix, Amyntor Ormenides, uttered the curse in anger and revengefully, μήποτε γούνασιν οἷσιν ἐφέσσεσθαι φίλον νιόν, 'that he (Phoenix) might never have a son to set upon the grandfather's knees.' That would be in the way in which the new-born Ulysses was placed by nurse Eurycleia on the knees of the knave Autolycus, that he might name him and know that the

³ I am told that L. and S. have modified their account of the word.

³ Not even in a Greek romance,

Heliod. *Aeth.* IV. 12: where the heroine's mother is ἄγονος καὶ ἄτεκνος, *sine prole ac liberis.*

vulture was driven away, Catullus, 68. 119. The same thing is found in Lucr. II. 614, Munro: '*quia numen qui violarint matris, et ingrati genitoribus inventi sint, significare volunt indignos esse putandos, vivam progeniem qui in oras luminis edant,*' 'must be deemed unworthy to bring a living offspring into the borders of light.' ἄγονος occurs only in that one place in Homer: ἄπαις and ἄτεκνος do not occur at all. When Ctesippus had thrown the cow's foot at Ulysses, *Od.* XX. 307, Telemachus says it was well he did not hit him, or he (Tel.) would have pierced him through and through with his spear, 'and then your father would be occupied about your funeral instead of your marriage.' That is the same curse. It occurs also *Od.* XVII. 476: 'I wish death may overtake Antinous before his marriage,' Ulysses to A., when he has thrown the footstool at him. And *Od.* 15. 524: 'Zeus knows whether he will bring about for them an evil day before their marriage,' Telemachus to Theoclymenus, of the suitors. Orestes invokes the same curse on himself, Aesch. *Cho.* 1006: ὀλοίμην πρόσθεν ἐκ θεῶν ἄπαις—'sooner let me die childless!' When Ulysses says, *Il.* 2. 260: μηδ' ἔτι Τηλεμάχοιο πατὴρ κεκλημένος εἶην, the same thing is meant: 'may I die childless!' for Telemachus was his only son, and τηλύγετος.

In proceeding to discuss the word τηλύγετος, *Il.* III. 175, where Helen says she left behind her παῖδα τηλυγέτην, I think I cannot do better than quote a few lines from Charles Sorel's *Histoire Comique de Francion*, p. 109, Garnier Frères, Paris, 1877. The book was first published in 1622 A. D. '*Un an après qu'il eut épousé cette femme, il eut une fille d'elle, et encore une autre au bout d'un même terme. Quant à moi, je vins au monde cinq années après qu'ils furent joints ensemble. . . . Ainsi je naquis dauphin.*' Sorel is evidently speaking of himself, and he is an exact example of a παῖς τηλύγετος. After teaching this true

meaning of the word for more than twenty years, I cannot yet profess myself satisfied as to its formation and derivation. The word is used with predilection, of a son, such as Francion, born after *two* sisters, or Orestes, *Il.* 9. 143, 482, born after *three* sisters, or Demophoön, *Hom. Ceres*, 101, after *four*, whose names were 'Callidice, Cleisidice, Demo the lovely, and Callithoe, who was eldest of all.' This reads very much as if it were the original of Virgil's '*primusque Machaon*,' *Aen.* 2. 263, where the first in order is mentioned later in the list. This is, I think, the primary meaning, and it brings us face to face with *θηλυτόκος*, 'producing only female offspring,' when the male offspring is most ardently looked for by the parents. The son is *πολύευκτος*, *ἀσπασίος τε*, *Hom. Ceres*. 164. The word is said of a child who is born when there has been an interval which made some doubt whether a child would be born at all, as in the case of Hermione, *Il.* III. 175, or when there was some fear that the mother was altogether *θηλυτόκος* and would not produce any son, *πολλοῖσιν ἐπὶ κτεάτεσσι*, *Il.* IX. 482, and *ἐπὶ κτεάτεσσι λιπέσθαι*, *Il.* 5. 153, 'to leave in charge of the property.'

Francion's father and Agamemnon, and Menelaus and Celeus were not old men; so that the word cannot mean 'born to the father in his old age,' but only 'at some distance from the time of marriage great enough to excite fear that no son would be born to inherit the wealth and carry on the name and fame of the father.' Of course the father *might* be old, as apparently in the case of Phaenops, *Il.* 5. 153, but that is only an accident. Megapenthes is a *τηλύγετος* son of Menelaus, *Od.* 4. 11, born to him from a slave girl, when he despaired of male offspring by Helen. Paris has no child by Helen, so that Hector's curse that he might be *ἄγονος* was realised.

In short, then, the word *τηλύγετος* is said of a son and heir (and in default of a son, a daughter) who has disap-

pointed the expectation of the would-be parents for some time, long enough to make them seriously anxious as to whether he would come at all; and often when the mother has shown a capacity for producing only female children, *θηλυτόκος*, as opposed to *αρρενοτόκος*, Arist. *Gen. An.* i. 18. 27. That such a son should be *ἀγαπητός*, Ptolemy Philadelphus in Theocr. 17. 64, *πολυέχτος ἀσπάσιός τε*, of Demophoön, *Hymn. Ceres*, 164, and *πολυάρητος*, *Od.* 19. 401, of Ulysses, is natural enough: 'well-beloved,' *bien-aimé*, and *chéri* are, however, only collateral and inferential meanings of the word. I have observed that sons born after sisters, as Shakspeare after Joan and Margaret, often unite the graces and talents of both sexes in a very charming manner; blending a Sapphic vigour with a Petrarchian tenderness, as Shakspeare does so conspicuously: *ἄρσενι γὰρ ῥώμῃ θῆλυν ἔμιξε χάριν*, Anth. Plan. 4. 287.

Ceres is called *μουννοτόκος* in Nonnus, *Dion.* 6. 31, *μουννοτόκοι δὲ τηλυγέτους διὰ παῖδας αἰὲ τρομέουσι τοκῆς*—'for the parents of only one child are always in anxious fear about the safety of their *τηλύγετος*.

The doubt which remains as to the formation of the word, although the true meaning is clear, and clearly unknown to the Greeks (Eur. *Iph.* T. 827), may be stated thus: one cannot be sure whether it is formed from *θῆλυς* and *γίγνομαι* in some such signification as is indicated above, or from *τῆλε*, *τῆλυ*, and *γίγνομαι* (Passow), meaning 'born at a time distant from the time of marriage of the parents.' I observe that the French traveller, Sir John Chardin, Evelyn's friend, and whose tomb may be seen in St. Paul's Cathedral, quotes casually a Persian word, 'tyoul,' of which one meaning is 'distant.' The distance might be only a few years, just enough to excite uneasiness. It ought not to be forgotten that the Roman proper name 'Proculus' was derived by them from *procul*, Paul. *ex*

Fest. p. 225, Müll., with some idea of 'distance,' probably the same as in *τηλύγετος*. Similar proper names are '*Opiter, cujus pater, avo vivo, mortuus est*'; *Vopiscus*, 'one of twins born alive after the premature birth and death of the other'; and *Agrippa* applied to those '*quorum in nascendo non caput sed pedes primi exstiterint*,' Aul. Gell. XIV. 16.

The preceding analysis has exhausted all the passages where Homer and others use *τηλύγετος*. I may say in conclusion that Oedipus was *τηλύγετος* of Laius, Pallas of King Evander, *Aen.* 8. 581, '*dum te, care puer, mea sola et sera voluptas, complexu teneo*,' and Ascanius of Aeneas, *Aen.* 6. 764, '*quem tibi longaevo serum Lavinia conjux educet*,' where Virgil gets himself into a hobble again about a child. Aeneas was in the full bloom and vigour of youth when he was drowned, about ten years after his famous combat with Achilles. Servius, driven to his wits' end about '*longaevo*,' says, '*i. e. Deo : aevum non nisi in deos venit*.'

The passage in Pindar, *Ol.* 11. 86, is about one sort of *παῖς τηλύγετος*. He says that the lyric encomium is to the victorious gymnast 'like a much longed-for son born to a father from his wife, when he has now got to the other side of youth : which son greatly warms his soul with love ; for wealth that is to have a strange interloper to take charge of it is most hateful to a dying man.' And Catullus seems to have had that passage before his mind when he said, 68. 119 :

'nam neque tam carum confecto aetate parenti
una caput *seri* nata *nepolis* alit,
qui cum divitiis *vix tandem inventus* avitis
nomen testatas intulit in tabulas,
impia derisi *gentilis* gaudia tollens,
suscitat a cano volturium capiti.'

The 'vulturium' is the *χωρωστής*, 'collateral relation' (only *once* in Homer): 'nor so dear to an aged grandsire is the life of a late-born grandson whom a daughter is nursing: which grandson, hardly at last obtained, when he has had his name entered in the well-attested will as heir to ancestral wealth, chases the vulture from the grandsire's hoary head, and thwarts the unholy joys of the baffled *χωρωστής*'—*gentilis* is the *χωρωστής* and *serus nepos* is the *τηλύγετος*, in this case, a grandson.

THE note on Homer's *πολέμιοι γέφυραι* seemed requisite, because the interpretation in Liddell and Scott, although substantially the same, is not very clearly expressed, and is given in a hesitating and undecided manner.

It may be added, that the old Roman historian, Q. Claudius Quadrigarius (History of Rome from the capture of the city by the Gauls to the seventh Consulship of C. Marius), who is always quoted with much respect for his Latin style and accurate narration of events, has used 'pons' in the same sense. Aulus Gellius, ix. 13, gives a long extract from Quadrigarius, where he represents the fight between T. Manlius Torquatus and the Gaulish giant to have taken place in sight of the two armies, 'in ipso ponti' (*sic.*). This can mean nothing but the *πολέμιοι γέφυραι*.

Homer uses the plural *γέφυραι*, because 'the intervening space' was continually changing, which was not the case when Torquatus fought.

JOHN F. DAVIES.

A little below, v. 448, *ὀμφαλόεσσαί* does not mean 'bossed' or 'spiked,' but 'humped,' 'with a convex form turned towards the enemy.'

In *Il.* v. 89: *τὸν δ' οὐτ' ἄρ τε γέφυραι ἐεργμέναι ἰσχανόωσιν*, the word *ἐεργμέναι* means 'that have been built to restrain' the river.

Ibid. v. 311: *καὶ νύ κεν ἔνθ' ἀπόλοιτο ἄναξ ἀνδρῶν Αἰνείας*—of course *ἀπόλοιτο* is *ἀπώλετο*. I think it ought to be written *ἀπόλωτο*. This borrowing of a *mora* by one syllable from an adjacent one occurs in *ὑπείρεχον* for *ὑπερεῖχον*,

ἔυρρεῖος for ἔυρρεός, ἀκηχέμενος for ἀκαχημένος, ἕως δ, pronounced οὗος δ, ἕο being made into οὔ, δαμείτε for δαμήτε, etc., etc.

Ibid. 336:

ἐνθ' ἐπορεζάμενος μεγαθύμον Τυδέος υἱὸς
ἄκρην οὐτάσσε χεῖρα μετάλμενος ὀξείῃ δουρὶ
ἀβληχρήν.

An amusing specimen of a Homeric πρόβλημα is given, Plutarch, *Symp.* ix. 4. The question is: 'Which of Aphrodite's hands did Diomedes wound?' 'You might as well ask with which leg was Philip lame,' is the answer. 'Not at all; for Demosthenes does not indicate it in the context.' Then two reasons are given why it was the right hand: she would be holding Aeneas in that as being the one with which she caught him up, and dropped him when it was hurt. On her arrival at Olympus, she is taunted by Athenè with having scratched her hand against the brooch of some Greek lady while caressing her: now it is with the right hand that one usually caresses a darling: Q. E. D.

Ibid. 387: χαλκῆν δ' ἐν κεράμῳ δέδετο τρισκαίδεκα μῆνας, 'and he was kept a prisoner in a copper jar for thirteen months.' This reads like something in 'The Thousand and One Nights,' and 'Le Diable Boiteux,' where Asmodeus is kept confined in a glass phial, well stoppered, for some period not stated. The 'stone-jug' is 'the prison' in thieves' jargon. In Cyprus the prison was called κέραμος, no doubt from its shape, the same as that of the Robur or Lautumiae on the Capitoline at Rome. Athenaeus, vi. 15, says that Cleopatra of Alexandria was the first to talk of ἀργυροῦν καὶ χρυσοῦν κέραμον, as if one were to say 'gold and silver porcelain.' It is clear that Homer was before her in saying χαλκοῦν κέραμον. Strabo, v. 12, speaks of 'wooden jars,' ξύλινοι πίθοι, for πίθος in Greece, and *cadus* in Italy, were never made of wood, and did not mean

'cask.' In Strabo, l. c., *πίθοι* means 'vats,' as large as those at James's Gate Brewery, for he says they were 'bigger than a house,' in Cisalpine Gaul, v. 218.

The exact and impartial criticism of Homer and Virgil in comparison together, as made by Macrobius, *Saturnalia*, Books III.-VI., is very valuable and praiseworthy. In passing on to the line of Homer which makes me mention him, I may say that Macr. always writes Vergilius, as it is written in the very old Medicean MS. of Virgil preserved at Florence. This MS. belonged to Macarius, brother of Turcius Rufius Apronianus Asterius, one of the consuls at Rome in the year 494 A.D. Turcius says in some elegiac verses written at the end of the Eclogues in the MS., that he went over it throughout, putting the right punctuation and correcting the clerical mistakes of the library-clerk who copied it, with his own hand. In talking with Dr. James Henry about this most carefully guarded MS. (never collated except while the chief Librarian holds it in his hand, in which way Dr. Henry collated the whole of its Aeneid, 'a courtesy repeated daily for several weeks,' as he says in his *Aeneidea*, vol. I. p. xxv.), Dr. H. used to say that it was quite probable that the MS. was as old as the time of Augustus, and might even be a copy of Virgil's own copy, and sold by 'Sosii, Fratres,' in some street off the Forum. That has never seemed to me to be improbable. But Dr. J. Henry held at the same time that *Vergilius* is the vulgar, easy, and slurring way of spelling and pronouncing the name: that you might as well say *vergo* for *virgo*, and *verga* for *virga* (the latter came into vogue but *vergo* never, for an obvious reason). In the Greek transcription both Βεργίλιος, Anth. II. p. 54, Jacobs, *πνείων εὐεπίης Βεργίλιος* was written, and Βιργίλιος, Anth. App. 158:—

εἰν ἐνὶ Βιργιλίῳ νόον καὶ μούσαν Ὀμήρου
Κλανδιανὸν Ῥώμη καὶ βασιλεῖς ἔθεσαν,

'Rome and her Caesars set up this statue of Claudian: the nice judgment of Virgil and the music of Homer are here united in one.' This piece of fulsomeness is of the same sort as Dryden's epigram about Milton. The Romans really cared little whether they wrote E or I, *see* Macr. i. 4. The two letters were nearly the same in appearance, f and l. But if it was worth while to keep the true form in *virgo* and *vir*, we might very well keep it in *Virgilius*, from whichever of the two the name is derived. Servius says, *Comm. init.*: '*adeo enim (Virgilius) verecundissimus fuit, ut ex moribus cognomen acciperet; nam dictus est Parthenias.*'

This reference to Macrobius is *à propos* of the lines, *Il.* v. 576:—

ἐνθα Πυλαιμένα ἐλέτην ἀτάλαντον Ἄρηϊ,
ἀρχὸν Παφλαγόνων—

as compared with *Il.* XIII. 643:—

ἐνθα οἱ νῖδς ἐπᾶλτο Πυλαιμένεος βασιλῆος,
Ἄρπαλιών.

Harpalion is soon killed by Meriones, and then come vv. 656–7:—

τὸν μὲν Παφλάγονες μεγάλῃτορες ἀμφεπένοντο·
ἐς δίφρον δ' ἀνέσαντες ἄγον προτὶ Ἴλιον ἱρήν,
ἀχνύμενοι· μετὰ δέ σφι πατὴρ κίε δάκρυα λείβων.

If *Il.* v. and XIII. were written by the original Homer, there is here a clear example of an oversight. In any case, it is nearly the only very important one. The opponents of the Wolfian school say that Homer incautiously interwove two different traditions into his poem. I feel sure that old Homer with his clear head, knowing well what he had to say, and not being bothered by any printing and writing, would make no such mistake. Macrobius contrasts the exactness and accuracy of the *Iliad* and

Odyssey, of which he adduces no blot, so well were they learnt off, with the many oversights in the Aeneid. I will translate the passage, *Saturn.* v. 15. After observing that Virgil mentions in his Catalogue, *Aen.* vii., the names of heroes who afterwards do nothing in battle, and celebrates for feats in battle some whom he did not mention—neither of which faults is committed by Homer except in the case of Nireus, only mentioned for his beauty—he goes on to say:—‘then with regard to those heroes whom Virgil mentions in his Catalogue, there is often a reckless confusion. Asylas kills Corinaeus in the Ninth Book, and then Corinaeus kills Ebusus in the Twelfth. Aeneas kills Camers in the Tenth Book, and Juturna presents herself in the form of a living Camers in the Eleventh. Chloreus is slain by Camilla in the Eleventh, and again by Turnus in the Twelfth.’ He might have added that ‘*fidus Achates*’ is said to have been in one of the ships that were lost in the storm, *Aen.* i. 120, but is the first mentioned as turning up, *ibid.* 175, as being in one of the seven which the storm did not subdue. Macr. asks: ‘Where is the Homeric accuracy to be found in all these instances?’ The answer is not without its pathos, and I take it from the same author, i. 24: ‘*audi quid de operis sui multiplici doctrina ipse pronunciet; ipsius enim Maronis epistola qua compellat Augustum, ita incipit “De Aenea quidem meo, si mehercule jam dignum auribus haberem tuis, libenter mitterem; sed tantum inchoata res est.”*’ Virgil means that he had only made a first draught of the poem, and was still in quest of materials, studying traditions and antiquities, the prefaces to Roman Histories given by the earliest writers (such as Cato, Pictor, Cincius, and Polybius), and the accounts preserved or indicated in the books of the Pontiffs and Augurs. The whole reason of Virgil’s oversights is told in ‘*tantum inchoata res est*,’ ‘I have only made the first cut in it,’ as if it were the first chop in felling a tree. For

it seems to me that *inchoare* must be akin to the old *co-inquēre* mentioned by Festus as meaning 'to cut into, lop, or begin to fell trees,' and occurring in line 17 of the Song of the *Fratres Arvales*. Virgil seems to have died soon after writing the letter, at about the same early age, 52, as Menander and Shakspeare.¹

Il. VI. 252: Λαοδίκην ἐσάγουσα, θυγατρῶν εἶδος ἀρίστην should, in my judgment, be inclosed in square brackets, both because of the Λαοδίκην ἐσάγουσα, which it is vain to try to justify or explain, and because the verse has evidently been introduced to show why Hecuba was outside the house at that time. It is an interpolation, ἐμβόλιμον.

In *Il.* VI. 348: ἔνθα με κῦμ' ἀπόερσε, I would read κε for με, and take ἀπόερσε as a solitary form from εἶρω = Lat. *deseruisset*, 'would have cast me out into the howling sea, and left me there.'

Ibid. 395, 6 :

Ἀνδρομάχῃ, θυγάτηρ μεγαλήτορος Ἡετίωνος,
Ἡετίων, ὃς ἔναιεν ὑπὸ Πλάκῃ ὑλήεσση.

Bentley writes a note on *Odyss.* I. 23 : 'Αἰθίοπας μετεκίαθε τηλόθ' ἴοντας, Αἰθίοπας, τοὶ διχθὰ δεδαταται κ. τ. λ. : *legendum* Αἰθίοπες : *si vera lectio*, *Iliad.* VI. 396.' Professor R. C. Jebb says rightly in 'English Men of Letters': Bentley, p. 513, 'surely this is a gratuitous Homeric solecism.' I some years ago corrected the verse thus :

. Ἡετίωνος,
Ἡετίωνος, ἔναιε δ' ὑπὸ Πλάκῃ ὑλήεσση,

and the sentence is parenthetical from the second Ἡετίωνος down to the end of v. 398, χαλκοκορυστῆ.

¹ It is expressly stated in the Lat. Anthol. that Menander died at 52. In Aul. Gell. xv. 7, Augustus congratulates himself on having passed the

grand climacteric, κλιμακτήρα, of famous men, Aristotle, Demosthenes, Cicero, &c., namely, 63 years of age.

The Twenty-first book of the Iliad is the work of an inferior rhapsodist, and can be regarded only as a spirited imitation of the genuine Homer. The passage above emended is there imitated, v. 86 :

γείνατο Λαοβόη, θυγάτηρ Ἄλταο γέροντος,
Ἄλτew, ὃς Δελέγεσσι φιλοπτολέμοισιν ἀνάσσει.

It will be observed that the imitator had Ἡερίωνος and not Ἡερίων before his mind, although he goes on with ὃς.

In *Ibid.* 488, 9 :

μοῖραν δ' οὐτινά φημι πεφυγμένον ἔμμεναι ἀνδρῶν,
οὐ κακόν, οὐδὲ μὲν ἐσθλόν, ἐπὴν τὰ πρῶτα γένηται,

I would take πεφυγμένον thus. If φεύγειν means 'I avoid' or 'get away from,' then φεύξομαι, which occurs eight times in *Il.* and *Od.*, will mean either 'I will let myself flee,' or 'I will get myself rid of,' on the analogy of κλέψομαι, 'I will let myself steal,' and κολάσομαι, 'I shall get myself punished.' In this way πεφυγμένος, a middle perfect, means 'one who has got himself rid of.' The Latin *fungor*, which has the same root *φυγ-*, *fug-*, with nasalisation, means the same, with some little diverse application, as usual. *Fungi* or *perfungi aliqua re* is 'to get rid of it, by undergoing it or performing it,' and it is not without reason that we talk of a 'perfunctory' performance of some office. *Fungor* is used by Lucretius, I. 442, Munro, as = *pati*, the opposite of *agere*, because it means the former of those two. The Italian *sciogliere il voto*, 'to get rid of,' i. e. 'to accomplish one's wish,' may be compared. Thus the two lines of Homer will mean : 'for I declare that no man, when once he has been born, is one who has got rid of his destiny, whether he be base or brave.'

(To be continued).

EMENDATIONS.

ARISTOPHANES—*Equites*, 32.

NIK. κράτιστα τοῖνυν τῶν παρόντων ἐστί νῦν
θεῶν ἰόντε προσπесεῖν του πρὸς βρέτας.

ΔΗΜ. ποῖον βρέτας· . . . ἐτεὸν ἡγεί γὰρ θεούς ;

Read—

ποῖον βρέτας, ὦ τάν ; ἐτεὸν ἡγεί γὰρ θεούς ;

Cf. Lysist. 1178 :

ποίοισιν, ὦ τάν, ξυμμάχοις ;

Lysist. 1163 :

ΛΑΚ. ἀμές γε λῶμες αἱ τις ἀμὶν τοῦγκυκλον
λῆ τοῦτ' ἀποδῶμεν. ΛΥΣ. ποῖον, ὦ τάν ;

—

CICERO, *ad Att.* 15, 1.

quid est autem cur ego personatus ambulem ? parumne foeda
persona est ipsius senectutis ?

The first question looks like an Iambic trimeter from some
old tragedy : perhaps from a prologue,

Quid est autem cur ego personatus ambulem ?

—

PLAUTUS—*Casina*, *Prol.* 20.

Ea tempestate flos poetarum fuit
 Qui nunc abierunt hinc in communem locum.
 Sed tamen absentes prosunt praesentibus.

Read :

Sed tamen absentes prosunt *PRAE* praesentibus.

We thus get a beautiful sentiment. The absent poets, the dead, are better than the present, the living. The line is

The emendation in Aristoph., *Equites* 32, is, I find, not new, having been made before by Dobree, and adopted, with a change of punctuation, by Blaydes, in his very scholarly edition lately published.

less than four words, it does not go very far from the true reading, which I believe is—

Di immortales, si Jovis jussu ad me iret pedibus, plumipes
 Qui perhibetur, prius venisset quam tu advenisti mihi !

Jovis jussu is used no less than four times in the *Amphitruo* of the errands of Mercury. For *plumipes* cf. Catullus, 55. 19 :

Adde huc plumipedes volatilesque,

where Ellis takes *plumipedes* to refer chiefly to the *πτερόπους* Ἑρμῆς. For the emendations proposed I would refer the reader to G. Goetz's edition.

PROPERTIUS, II. 8. 8.

Vinceris aut vincis : haec in amore rota est.

My main point of dissension with Prof. Postgate is respecting the reading of this line. I still disbelieve in *vincis* here. How stands the case as to Propertius and his contemporaries who wrote elegiacs? Neither Ovid¹ nor Tibullus admits a short syllable at the end of the first member of the pentameter. In the mss. of Propertius we find *three* such instances—*ingenuūs*, *ossā*, *vincis*. Of these instances *two* are condemned as corrupt. What, I ask, is the probability as to the third? The correction *at vinces* is easy, and, in my opinion, certain. Defending *vincis*, Prof. Postgate quotes Martial; but Martial's usage is not decisive on a point in Augustan poetry: and even Martial only allows a verb ending in *-t* to be lengthened in the position in question, and even that very rarely.

But I am surprised at finding Caesural lengthening in hexameters quoted as having much bearing on the point. Persius' *Quid metuīs* no more defends *vincis* in a pentameter than Virgil's *Pectoribūs* does: and so *fuīt* in a hexameter (4. 1, 17) is by no means remarkable; Caesural lengthening in hexameters, especially of third persons of verbs ending in *-t*, being common enough.

I. 8, 25, 26.

Et dicam : 'licet Artaciis considat in oris
Et licet Hylaeis : illa futura mea est'.

So I would now write this passage: keeping *Hylaeis* not

¹ Prof. Postgate is too good a scholar to refer to *sanguis*, *petiūt*, *rediūt*, and other verbs in *-iūt*, in this position: the

last syllable in these words being really, sometimes, or always, long.

Hylleis (N *hileis* with only one *l*). What I believe Propertius wants to say is: 'though my lady moors her bark in the farthest regions of the earth, she will be true to me'. Therefore, instead of emending the ms. readings *atraciis* and *hileis* so as to bring in comparatively near places in Greece, I rather look for the most remote regions: and such I find in *Artace* and *Hylaea*.

Artace is well known as the name of a harbour, town, and mountain near Cyzicus, from which the fountain Artacie was named, Apoll. Rhod. 1, 957: Orph. Arg. 496. Hylaea is mentioned as a very distant region beyond the Scythians, by Herodotus iv. 9, 54, 55, 76. In the first of these passages it is stated that 'Hercules, having gone over all Scythia, at last arrived at the land called Hylaea': in the last it is said that Anacharsis, having touched at *Cyzicus*, went on to Scythia and *Hylaea*, where he was slain by the Scythians.

II. 26, 37-40.

Quicumque et venti miserum vexastis Ulixen,
 Et Danaum Euboico litore mille rates:
 Et qui movistis *montis* duo, cum ratis Argo
 Dux erat ignoto missa columba mari.

montis is my emendation for *litora* of the mss., which I regard as a very poor attempt to fill up a blank. The two mountains are the Symplegades. I have met the following strong confirmation of this conjecture in Seneca, *Medea*, 341 *seqq.*; where, speaking of these clashing rocks, he thus writes:

Cum *duo montes*, hinc atque illinc
 Clastra profundi, subito impulsu
 Velut aethereo gement sonitu,
 Nubesque ipsas spargeret atras Mare deprensum.

The lines I have referred to in Valerius Flaccus are 2, 380 :

dum spes mihi sistere *montes*
Cyaneos, vigilemque alium spoliare draconem ;

and 4, 707 :

Unde per hos iterum *montes* fuga ?

In both passages the Symplegades are the mountains.

IV. 1, 39-42.

Huc melius profugos misisti, Troja, Penates,
 Huc quali vecta est Dardana puppis† ave !
 Jam bene spondebant tunc omina quod nihil illam
 Laeserat abiegni venter apertus equi.

Puppis I consider corrupt, beyond question. For a passenger in Latin is said *vehi*, not the vessel : and *illam* in the third line cannot refer to *puppis*.

I am nearly convinced that we should read *Dardana Pallas*, which I formerly suggested. This would be a development of *Penates*, and *illam* exactly suits it.

Aeneas was believed to have brought an image of Pallas with him from Troy to Rome. Whether this was the Palladium captured by Ulysses and Diomedes, afterwards recovered by Aeneas, or another image of Pallas, was disputed. Probably there were two conflicting legends: one describing the capture of the Palladium, one its conservation by Aeneas. The image of Pallas brought from Troy by Aeneas, the *Penates* of Troy, was kept in the temple of Vesta, at Rome. We find, among many, the following allusions to it :—Ov. Trist. 3. 1, 29 : *Hic locus est Vestae quæ Pallada servat et ignem*. Liv. 26, 27 : *Vestae*

aedem petitam et aeternos ignes et conditum in penetrati fatale pignus imperii Romani. Lucan 1. 597, 598: *Vestalemque chorum ducit vittata sacerdos, Trojanam soli cui fas vidisse Minervam.* Claudian in Eutrop. 1. 328, 329: *Trojanam sola Minervam Virginitas Vestalis adit flammisque tuctur.* Lucan 9. 990, *seqq.* is especially noticeable, from its general similarity to the passage in Propertius :

Di cinerum, Phrygias colitis quicumque ruinas,
Aeneaeque mei, quos nunc Lavinia sedes
Servat et Alba, *Lares*, et quorum lucet in aris
Ignis adhuc Phrygius, nullique adspecta virorum
Pallas, in abstruso pignus memorabile templo.

Reading these passages, I have no doubt that either *Pallas* is to be restored for *puppis*, or some word denoting *Pallas*. I cannot think of any such word coming nearer *puppis* than the word *Pallas* itself; and therefore I suppose the transcriber thought the final syllable in *Pallas* was long and deliberately changed it, or else that the middle of the word was illegible.

IV. 3. 51, 52.

Nam mihi quo Poenis teſ purpura fulgeat ostris,
Crystallusque meas ornet aquosa manus ?

So N. For *te* I have suggested, and would now read *ter*. True, *bis* is generally the phrase: *Tyrio bis murice tinctae*: and I have not met the expression 'triply-dyed' elsewhere. But Martial 2. 29. 3 seems sufficient to defend it: '*Quaeque Tyron totiens epotavere lacernae*'.

IV. 4, 47.

Cras ut rumor ait tota pugnabitur urbe :
Tu cape spinosi rorida terga jugi.

I formerly conjectured *cessabitur*, and this conjecture is adopted by Baehrens. I now rather incline to *potabitur*, the first two syllables of which were probably lost after *tota*. I communicated this conjecture to Prof. Postgate before the publication of his Selections, more than two years and a-half ago. The same conjecture has, I am informed, suggested itself to Mr. J. S. Reid of Cambridge.

A. PALMER.

JOWETT'S THUCYDIDES.

II.

A RECENT friendly discussion between Mr. D. B. Monro and Prof. Mahaffy shows the necessity of definition. Mr. Monro, for example, says that *διὰ* with the accusative, denoting motion, is distinctively Homeric. In reply, Mr. Mahaffy neatly quotes *δι' αἰθέρα τεκνωθέντες*, Soph. O. T. 867. Now surely Phrynichus would turn in his grave if he heard a tragic chorus quoted as Attic. Attic for the Atticist means the language of the Old Comedy, Plato the philosopher, and the standard orators. This may be pedantic, but it is precise, and practical. On the other hand, Tragedy is the link between Attic proper and the Ionic of Herodotus and Homer. As a matter of fact, *δι' αἰθέρα τεκνωθέντες* need not refer to motion in space at all. Olympus is the sire of the laws, and they quicken in the pure aether. *Διὰ* in Plato with the accusative expresses the continuous action of circumstances; so that *οὐρανίαν δι' αἰθέρα* represents the womb or mother, and Zeus in the Bacchae moulds a piece of aether into a mock Dionysus. Another point in the controversy will be treated anon.

The canon of Phrynichus is the Old Comedy, Plato, and the orators. This being so, the modern Atticist is at once convicted of temerity. We have not the Canonical Books complete; so that in saying a phrase is not Attic, we put out of count the lost plays of the Old Comedy. Outside of the extant books, there is room and verge enough for many words and phrases. We have no evidence to throw light on the non-existent. At the same

*

time, we have no right to invent a word. If we make the extant the test of the extant, we are wrong, for we ignore the non-extant. If, on the other hand, we go beyond the extant, we quit the only fulcrum we have. The Latin scholar ought to bear in mind, that if Horace and Lucretius were lost, our present stock of Latin words would be materially diminished. But no one has yet been silly enough to correct Horace by Vergil—to expunge all words not found, say, in the First Georgic. Why not?

‘Cultivated language,’ says Mr. Munro, in a passage which cannot be too often quoted, ‘is made up of inconsistent metaphors which time has smoothed over.’ Now the emendator undoes the work of time. He exaggerates incongruities into irreconcilabilities—

As when we dwell upon a word we know,
Repeating, till the word we know so well
Becomes a wonder, and we know not why.

Then, besides the involuntary daze produced by staring at one word, apart from the context, there is the lust to misapply. The juvenile emendator is as anxious to pick a hole as a Roman governor was to pick a quarrel with the neighbouring barbarians, in the hope of getting a triumph at home. The English reader may see in Bentley’s Milton the process in full swing. Again, the result of emendation is most uncertain; the passage with regard to the swaddling-clothes in the *Choëphoroe*, and that in Catullus about the thief, appear at first sight capable of certain restoration. In each case, the drift of the whole passage is as plain as if the corrupted line were scored out. But, I venture to assert, no one has restored either. In a word, classical emendation seems to be in the condition that the solution of acrostics would be, if there were no acrostic editor endowed with omniscience and infallibility. Every

one would fight for his own guess. For guess it is, and nothing more.

On the other hand, the critic who defends the Vulgate does not thereby say that it is sound—far from it—but that the emendator has not full data for his restoration. Has he? If he has, he must contend that the recovery of the lost Greek and Latin treasures would throw no new light on what we have—a position too monstrous even for a restorer. As one advances in years, the more he sees in the great writers of Greece and Rome: in them, and in them only, is language in perfection to be found; and it is somewhat hard that an ancient cannot be read now-a-days without being dazzled by the brilliant transpositions of Mr. A., and the no less brilliant asterisks of Mr. B., both resting upon evidence on which the dullest of Shallows would refuse to convict a poacher.

More, apparently, will be gained by studying a disputed passage in connexion with the drift of the context than by alteration; and, after all, alteration is based on context.

II. xli. 3.

Κακοπαθεῖ is objected to by M. Cobet and Mr. Mahaffy, but is defended by *κακοπαθοῦντες δὲ ἤδη*, I. lxxviii. 2; and by *οὐδὲν ὀλίγον ἐς οὐδὲν κακοπαθήσαντες*, VII. lxxxvii. 4. *Κακουργεῖν* is the regular word for an assailant, III. i. 2; if he gets the worst of it, he *κακοπαθεῖ*.

II. lxxxvii. 11.

οἱ δὲ ἀγαθοὶ τιμῶσονται.

Arnold objects to Kühner making the verb middle, and Monk's note on Hipp. 1458 is well known. That it

amounts to nearly the same thing is quite true; but this is the very bane of precise thinking: we should look only at what is said, not what it amounts to in the long run.

III. xvii. 4.

ἐνεργοὶ κάλλει; why not take κάλλει for the good condition of the ship—*trimness*? everything in *ship-shape*, the quality a sailor admires. The datives, as in the idiom with αὐτὸς, denotes the range or sweep of the verb; so in Thuc. I. lxxx. 7, τῇ γῇ δουλεῦσαι, to bound their slavishness by the land; i. e. to carry it to that extreme. So of the dative of the agent, so called, after a passive verb, the action extends to and is limited by him.

III. x. 5.

δούλωσιν ἐπαγομένους.

Ἐπάγεται is the regular word for bringing on political changes; and though it is frequently used of bringing in an outsider, there is nothing to prevent it being used of a condition, as here.

III. xviii. 4.

If the perfect ἐγκατακοδόμηται is sound, it is to be justified by the presents ἀφικνοῦνται and περιτειχίζουσι. *They arrive, and, while they work at the wall, posts are set.* The perfect would thus describe the act as just completed, while the rest was described as going on.

III. xi. 3.

Τὰ πράγματα ἐφαίνετο καταληπτά.

They thought, Arnold; so J. But ἐφαίνετο is it was

evident; φαίνεται is always objective; δοκεῖ, subjective. Forgetting this has led to the perversion of the word phenomenon in philosophy.

III. xxxi. 1.

ἄλλοι δὲ τινες τῶν ἀπ' Ἰωνίας φυγάδων καὶ οἱ Λέσβιοι ξυμπλέοντες, παρήνουν, ἐπειδὴ τοῦτον τὸν κίνδυνον φοβεῖται, τῶν ἐν Ἰωνίᾳ πόλεων καταλαβεῖν τινὰ ἢ Κύμην τὴν Αἰολίδα, ὅπως ἐκ πόλεως ὁρμώμενοι τὴν Ἰωνίαν ἀποστήσωσιν. ἐλπίδα δ' εἶναι· οὐδενὶ γὰρ ἀκουσίως ἀφίχθαι· καὶ τὴν πρόσοδον ταύτην μεγίστην οὖσαν Ἀθηναίων ἦν ὑφέλωσι, καὶ ἅμα, ἣν ἐφορμῶσιν αὐτοὺς δαπάνη σφίσι γίγνηται, πείσειν τε οἴεσθαι καὶ Πισσοῦθνην ὥστε ξυμπολεμεῖν.

Retaining ἐφορμῶσιν, the reading of every MS., and making it the participle, and reading αὐτοὺς with E (Palatine), the sense is, *and at the same time, if σφίσι, they, the Peloponnesians, should incur expense in starting them, the Ionians*, as belligerents. The Spartan dread of expense would be allayed by the hope of Persian subsidy. ἐφορμάω in the active is *to start* or '*float*,' *set up*. τε would then mark the apodosis, as in the older language.

III. xxxvii. 2.

διὰ γὰρ τὸ καθ' ἡμέραν ἀδεὲς καὶ ἀνεπιβούλευτον πρὸς ἀλλήλους καὶ ἐς τοὺς ξυμμάχους τὸ αὐτὸ ἔχετε, καὶ ὃ τι ἂν ἡ λόγῃ πεισθέντες ὑπ' αὐτῶν ἀμάρτητε ἢ οἰκτῷ ἐνδῶτε, οὐκ ἐπικινδύνως ἡγείσθε ἐς ὑμᾶς καὶ οὐκ ἐς τὴν τῶν ξυμμάχων χάριν μαλακίεσθαι, οὐ σκοποῦντες ὅτι τυραννίδα ἔχετε τὴν ἀρχὴν καὶ πρὸς ἐπιβουλευόντας αὐτοὺς καὶ ἄκοντας ἀρχομένους· οὐκ ἐξ ὧν ἂν χαρίζεσθε βλαπτόμενοι αὐτοὶ ἀκροῶνται ὑμῶν, ἀλλ' ἐξ ὧν ἂν ἰσχυρὴ μᾶλλον ἢ τῇ ἐκείνων εὐνοίᾳ περιγένησθε.

This passage will try the mettle of the Thucydidean critic. Nothing is easier than to read οἶ, and nothing then is easier than the construction. But that it did not

occur in the older MSS. is plain. What then? Nothing is so emphatic in Greek as the asyndeton, because the Greeks were so studious of making logical relations explicit by particles. So in Demosthenes:—Ἵμεῖς δέ, ὦ ἄνδρες Ἀθηναῖοι, πλείστην δύναμιν πάντων ἔχοντες, τριήρεις, ὀπλίτας, ἱππείας, χρημάτων πρόσδοτον, τούτων μὲν μέχρι τῆς τῆμερον ἡμέρας οὐδενὶ πώποτε ἐν δέοντι κέχρησθε, οὐδενὸς δ' ἀπολείπεσθε. ὥσπερ οἱ βάρβαροι πυκτεύουσιν, οὕτω πολεμεῖτε Φιλίππῳ.—*Phil.* i.

III. xliii. 5.

εἰ γὰρ ὁ τε πείσας καὶ ὁ ἐπισπόμενος ὁμοίως ἐβλάπτοντο, σωφρονέστερον ἂν ἐκρίνετε· νῦν δὲ, πρὸς ὁργὴν ἦν τινα τύχῃτε ἔστιν ὅτε σφαλέντες, τὴν τοῦ πείσαντος μίαν γνώμην ζημιούτε, καὶ οὐ τὰς ὑμετέρας αὐτῶν, εἰ πολλὰ οὖσαι ξυνεξήμαρτον.

The meaning is, *but now, under the influence of anger for occasional disaster, you punish*. ἔστιν ὅτε denotes rarer cases than ἐνίῳτε, and ὁργὴν ἦν τινα = ὁργὴν οὐ, like pro qua mercede secuti. That is to say, disasters occur occasionally, and then in a passion you punish the proposer.

III. xliv. 3.

ἦν—εἰεν.

That Thom. Mag. should record this anomaly is another argument against Mr. Mahaffy's notion, that δὲ ἂν c. *opt.* survives in Thuc. Thom. Mag. would most likely have noticed it too.

III. xlix. 3.

τῆς δευτέρας = τῆς προτέρας.

Could Thucydides have said so? Yes, if the second

ship were the more important, as it was, just as *hic* in Latin is applied to the more important member. *If the second could overtake the first.*—J. But φθασάσης must mean *getting in first*.

III. lix. 1.

μη ὦν πεισόμεθα μόνον δεινότητα κατανοοῦντας, ἀλλ' οἱοί τε ἂν ὄντες πάθοιμεν καὶ ὡς ἀσπάμηνον τὸ τῆς ξυμφορᾶς, ᾧ τινί ποτ' ἂν καὶ ἀναξίῳ ξυμπέσοι.

This is cited by Mr. Mahaffy to show that *δε* ἂν c. *opt.* survives in Attic. But surely ἂν goes with ξυμπέσοι as an apodosis, *upon whom, under given conditions, it would light*. In iv. 19, καὶ ἄμεινον ἡγούμενοι ἀμφοτέροις μη διακινδυνεύεσθαι, εἴτε βίᾳ διαφύγοιεν παρατυχούσης τινὸς σωτηρίας, εἴτε καὶ ἐκπολιορκηθέντες μᾶλλον ἂν χειρωθεῖεν—εἴτε βίᾳ διαφύγοιεν παρατυχούσης τινὸς σωτηρίας is a protasis, *if they get out*, εὔ ἂν εἶεν, the so-called optative of deliberation. Here the person deliberating asks what would happen *if* he did so-and-so; here there is no apodosis expressed; but in μᾶλλον ἂν χειρωθεῖεν the apodosis is expressed. In J.'s Index, ii. the passage is referred to as 'the optative with and without ἂν in parallel clauses'! The passage

θᾶσσον ἢ λέγοι τις,

Hipp. 1186,

is perhaps defensible as an epicism in the narrative of a messenger. In

πῶς οὖν τάδ', ὡς εἴποι τις, ἐξημάρτανες,

Andr. 929; and

ὥσπερ εἴποι τις 'τόπος,'

Av. 180,

correction is obvious, but the particular phrase ὡς εἴποι τις may be a survival of a pre-Atticism. At all events, the

popular notion that the optative can be used in the sense of *may* without *ἂν* is erroneous. *May* is ambiguous, marking both protasis and apodosis. In the latter sense *ἂν* is required certainly in prose. The omission of *ἂν* in phrases like *καλὸν ἦν* are no exception, for the exigencies of *τὸ καλὸν* are stated, not by way of hypothesis, but of postulate. Its omission after *οὐκ ἔσθ' ὅπως* is no exception, *s. g.*,

οὐκ ἔσθ' ὅπως λέξαιμι τὰ ψευδῆ καλά,

P. V. 292,

is literally *that I should make lies right is not* (possible). Messrs. Mahaffy and Bury's note on *Hipp.* 1186 is misleading. Their version of *Andr.* 929, *suppose one to urge*, is just the same as to translate it, *some one may say*.

III. lxviii. 2.

ἡγούμενοι τῇ ἑαυτῶν δικαίᾳ βουλήσει ἔκσπονδοι ἤδη ὑπ' αὐτῶν κακῶς πεπονθέναί.

Why not take *τ. ἐ. δ. β. = τῷ ἑαυτοῦς δίκαια βούλεσθαι* = their just request, *i. e.* demand. *βούλησις* is the mildest form of stating the demand.

III. lxxxiii. 1.

τὸ εὐθες οὐ τὸ γενναῖον πλείστον μετέχει.

The genitive denotes the more important ingredient, as in the phrases *μετέχειν τῶν ιδεῶν, τοῦ ἐνός*.

III. lxxxiii. 2.

οὐ γὰρ ἦν ὁ διαλύσων οὔτε λόγος ἐχυρὸς οὔτε ὄρκος φοβερὸς, κρίσεις δ' ὄντες ἅπαντες λογισμῷ ἐς τὸ ἀνέλπιστον τοῦ βεβαίου, μὴ παθεῖν μᾶλλον προεσκόπουν ἢ πιστεῦσαι ἐδύναντο.

The Scholiast's *ῥέποντες* seems right : literally *men*

universally being fitter for a calculation based on the despair of stability; i. e. everybody agreed on discarding stability when they sat down 'in a cool hour' to calculate how they might advance themselves and circumvent their enemies. Their αἵτημα—postulate—was non-stability. κρείσσονος then would signify being better at that than at the opposite, showing more deftness. In a word, they were utilitarians, but from their moral arithmetic they had blotted out stability.

III. cxiii. 5.

οὐκουν τὰ ὄπλα ταυτί φαίνεται, ἀλλὰ πλείον ἢ χιλίων.

The construction is—*The arms here are plainly not the arms of two hundred men, but make a larger show than the arms of a thousand men would make.*

φαίνεται, as always, describes the presentation to the senses. Both Arnold and Jowett seem to slur over the meaning.

IV. viii. 9.

ὁ Μολόβρον.

This is the word applied by Melanthius to Ulysses, *Od.* 17, 127, when coming to his palace as a beggar. Curtius makes it *dirty young pig*, from μολ = μελ = black, and βρον. But Ulysses strips large, and is noticed for his dignity.—*Od.* 20, 194; 18, 67–8.

Curtius' derivation may be accepted, but differently explained, as *dark-born*: cf. σκότιος, and, as a name of a Spartan, might be Bastard.

IV. lxxii. 4.

πρὸς αὐτὴν τὴν Νισαίαν.

Arnold says the dative is required, but the accusative marks the limit of the action : cf.

πρὸς ἐσπέρους τόπους

ἔστηκε.

P. V. 348.

That is, wherever he is set, it is not beyond ἐσπέρους τόπους.

IV. lxxviii. 2.

τὴν γὰρ Θεσσαλίαν ἄλλως τε οὐκ εὐπορον ἦν διέναι ἄνευ ἀγωγῶ, καὶ μετὰ σπλυν γε δῆ.

i. e. καὶ μετὰ σπλυν γε οὐκ εὐπορον δῆ; that is, it was most difficult. A sentence might end thus : *for heavy regiments particularly*. Cf. οἱ δ' ἱππεῖς διασπειρόμενοι ἐφ' ὅσον καλῶς εἶχεν, ἔκαιον ᾗ ἐβάδιζον, καὶ οἱ πελτασταὶ ἐπιπαριόντες κατὰ τὰ ἄκρα ἔκαιον πάντα ὅσα καύσιμα ἐώρων, καὶ ἡ στρατιὰ δέ, εἰ τι νικῶν παραλειπομένη ἐντυγχάνοιεν.—Xen. An. VI. ii. 19.

IV. cxvii. 2.

τοὺς γὰρ δὴ ἄνδρας περὶ πλείονος ἐποιούντο κομίσασθαι, ὥς ἔτι Βρασιδᾶς εὐτύχει καὶ ἔμελλον, ἐπὶ μείζον χωρήσαντος αὐτοῦ καὶ ἀντίπαλα καταστήσαντος, τῶν μὲν στέρεσθαι, τοῖς δ' ἐκ τοῦ ἴσου ἀμυνόμενοι κινδυνεύειν καὶ κρατήσκειν.

The more Brasidas held in hand, the tighter would be the hold the Athenians would keep of their prisoners, whose value would rise in proportion to what Brasidas might win ; for they must be got back at any price. Continuance of hostilities might lead to the loss of the prisoners;

and in a contest on equal terms risk the final issue of the war, τοῖς ἐκ τοῦ ἴσου ἀμυνόμενοι, *fighting on equal terms*. That is, Brasidas had not made the score even: if even, they risked the match: καὶ κρατήσῃν = μὴ κρατήσῃν, as verbs implying fear or doubt may take—(a) the infinitive alone; (b) the infinitive with μὴ; and (c) with μὴ οὐ. The meaning in English would be the same.

IV. CKVIII. 7.

καθ' ὅτι ἂν ἐσίῃ ἡ πρεσβεία.

Poppo says ἐσίοι is required. But the subjunctive is more near the *ipsissima verba* than the optative.

IV. CKXVI. 2.

ἀγαθοῖς γὰρ εἶναι ὑμῖν προσήκει τὰ πολέμια οὐ διὰ ξυμμάχων παρουσίαν ἐκάστοτε, ἀλλὰ δι' οἰκείαν ἀρετὴν, καὶ μηδὲν πλῆθος πεφοβήσθαι ἐτέρων, οἳ γε μὴδὲ ἀπὸ πολιτειῶν τοιούτων ἦκατε, ἐν αἷς οὐ πολλοὶ ὀλίγων ἄρχουσιν, ἀλλὰ πλειόνων μᾶλλον ἐλάσσους.

οὐ in the last clause is justified by the general use of μᾶλλον ἢ οὐ, and μὴδὲ expresses a *fugiendum*, from these constitutions *you abhor*.

V. LXXVII. 4.

εἴμεν λῆν τοῖς Εἰπιδαυρίοις ὄρκον, δόμεν δὲ αὐτοῖς ὁμόσαι.

That is, δόκει, that it be *agreed that the Epidaurians take oath ὄρκον εἶναι, at their discretion λῆν* = restrictive infinitive, *and that the Argives tender the oath to them*. The oath *in litem*, preserved in Scotch Law: *cf.*

ἀλλ' ὄρκον οὐ δέξαιτ' ἂν, οὐ δοῦναι θέλει.

Eum. 429.

That is, the Epidaurians may take the oath if they like, and the Argives may tender it.

V. xcvi.

ὥστε, ἔξω καὶ τοῦ πλεόνων ἄρξαι, καὶ τὸ ἀσφαλὲς ἡμῖν διὰ τὸ καταστραφῆναι ἂν παράσχοιτε (ἄλλως τε καὶ νησιῶται ναυκρατόρων καὶ ἀσθενέστεροι ἐτέρων ὄντες), εἰ μὴ περιγένοισθε.

The inevitable result is put sarcastically as a mere possibility, and the words ἄλλως—ὄντες put in parentheses develop the sarcasm.

V. cxi. 6.

σκοπεῖτε οὖν, καὶ μεταστάντων ἡμῶν, καὶ ἐνθυμείσθε πολλάκις ὅτι περὶ πατρίδος βουλευέσθε, ἣν μῖα περὶ καὶ ἐς μίαν βουλὴν τυχοῦσάν τε καὶ μὴ κατορθώσασαν ἔσται.

The following ekes out the construction :—

ὅτι περὶ πατρίδος βουλευέσθε [βουλὴν], ἣν [βουλὴν] μῖα περὶ καὶ ἐς μίαν βουλὴν [βουλευέσθαι] ἔσται.

βουλὴ and πατρίς being both feminines has led to confusion. τυχοῦσαν καὶ μὴ κατορθώσασαν, as equivalent to *which perhaps may fail*, ἣ καὶ οὐ κατορθώσασα τύχοι ἂν. It is a reminder of what hung upon the council, and not of what the Melians felt.

VI. i. 2.

διείργεται τὸ μὴ ἡπειρος οὔσα.

This is stronger than εἶναι, because εἶναι is understood ; i. e. τὸ μὴ ἡπειρος οὔσα εἶναι.

VI. xi. 6.

ἀλλὰ τὰς διανοίας κρατήσαντας θαρρεῖν,

being superior in spirit. J. makes κρ. active : cf. ἄξιον τι τῆς διανοίας δρᾶν, VI. xxi. 1 ; ἡσώντο ταῖς γνωμαῖς, VIII. lxvi. 3.

VII. xiii. 2.

ἐπ' αὐτομολίας προφάσει.

Rightly, J.: *the excuse a deserter makes*. ἐπὶ, c. dat. denoting that on which the action is built; as to the phrase, cf. πρόφασις τε ἐπιεικῆς . . . τῆς ἀποστάσεως, III. ix. 2. Grote's referring αὐτομολίας to the enemy implies a nicety of feeling worthy of the Pirates of Penzance.

VII. lxxxiv. 3.

ἑμπαλασσύμενοι. It is tempting to compare this with the English *foul* in the double sense of *staining*, or *getting tangled*. But it is more likely that they are two distinct words—the first being περκνός = σπερκνος; the second πλίκω, the Sanskrit in each case being different. The sense is *getting foul of the baggage, they went under water*: cf. περὶ αὐτὰ καταρρεῖ.—Dem. Olyn. i.

VII. lxxxvi. 5.

διὰ τὴν πᾶσαν ἐς ἀρετὴν νενομισμένην ἐπιτήδευσιν.

On account of his complete observance of the obligations of society. Ἀρετή is, as seen in the locus classicus, Rep. I. 353 b. e.—*efficiency, serviceableness*; ἐς, as usual, denotes the compass of the act; and νενομισμένην is not νομίμον, as J.

objects, but settled by all the laws and usages of Athens, the codes of religion, law, and etiquette.

This passage throws light on that relating to Antipho, ἀνὴρ Αθηναίων τῶν καθ' αὐτὸν ἀρετῇ τε οὐδενὸς ὕστερος, *i. e.* in the moral and intellectual qualities required in a public man. Plato's words should be kept in view: οὐκοῦν καὶ ἀρετὴ δοκεῖ σοι εἶναι ἐκάστω ὥπερ καὶ ἔργον τι προστέτακται, 353 *b*. ἀρετὴ is adjustment to the environment.

VIII. lxviii. 1.

Κράτιστος . . . ἃ ἂν γνολῇ εἰπεῖν. The ἂν is quite wrong, for the construction is ἃ γνολῇ εἴποι ἂν. Ἄν is not used in the protasis, unless as a survival of the same proposition, when it had done duty in a previous sentence as an apodosis.

VIII. xlv. 2.

τοῖν δυοῖν πολεοῖν.

The masculine article with the feminine noun may be a survival of a wider principle known to the Shemitic scholar, that the feminine noun takes a masculine numeral, and *vice versa*. It may be that, as the feminine denoted collectivity, the masculine was the index of individuality. Even in the case where the feminine is *nomen unitatis*, the masculine is the more complete notion.

VIII. xlv. 3.

καὶ οὐκ εἰκὸς εἶναι Λακεδαιμονίους ἀπὸ μὲν σφῶν τῶν Ἑλλήνων ἐλευθεροῦν νῦν τοὺς Ἑλλήνας, ἀπὸ δ' ἐκείνων τῶν βαρβάρων, ἣν μὴ ποτε αὐτοὺς μὴ ἐξέλωσι, μὴ ἐλευθερώσαι.

ἦν—μή = one notion = *unless*: μὴ—ἐξέλωσι = one notion,

a *fugiendum*, they *fail-in-expelling*. The fulfilment of this reserved condition nullifies the preceding hypothesis.

VIII. lxxxviii. 1.

ἐνθὺ τῆς Φασήλιδος καὶ Καύνου.

The order is reversed, for he must have touched at Caunus before Phaselis; so in 108, 1 ἀπὸ Καύνου καὶ Φασήλιδος, the order is inverted. This may explain anti-climax in the orators, such as ἀπόλωλε καὶ νενόσηκε. The more remarkable notion is put first; but, as it is not the whole statement, it is complemented by the weaker.

VIII. xc. 5.

ἐντεῦθεν προαιρῶντας πωλεῖν.

This is a good illustration of the meaning of προαίρεσις applied to the Will. Another ethical term—σωφροσύνη—is illustrated in xiv. 5. It plainly there denotes the principle of order.

(To be continued).

NOTES ON THE NEW EDITION OF LIDDELL AND SCOTT.

THERE are few works in which finality is so unattainable as a Lexicon. I do not, therefore, while pointing out certain inaccuracies in the Seventh Edition of Liddell and Scott's Greek Lexicon, wish to disparage the diligence and scholarship with which it has been revised, or to depreciate the importance of the corrections and improvements which have been introduced, and that have raised still higher the esteem in which the work has always been held.

1. μελεδαίνω. γῆμαι δὲ κακὴν κακοῦ οὐ μελεδαίνει ἐσθλὸς ἀνὴρ, 'a good man *cares* not to marry a bad woman, *Theogn.* 185; so Lat. *non curare* = *detrectare*'. The true explanation is: 'feels no difficulty about marrying', 'does not hesitate to marry'. The whole passage is as follows:—

κριοὺς μὲν καὶ ὄνους διζήμεθα, Κύρνε, καὶ ἵππους
εὐγενέας· καὶ τις βούλεται ἐξ ἀγαθῶν
βήσεσθαι, γῆμαι δὲ κακὴν κακοῦ οὐ μελεδαίνει
ἐσθλὸς ἀνὴρ, ἣν οἱ χρήματα πολλὰ διδῶ.
οὐδὲ γυνὴ κακοῦ ἀνδρὸς ἀναίνεται εἶναι ἄκοιτις
πλουσίου· ἀλλ' ἀφγεὼν βούλεται ἀντ' ἀγαθοῦ.

2. ἐπιστρέφομαι. *Theogn.* 440 is quoted as an instance of this verb governing a *gen.*, but the passage is

νήπιος, ὃς τὸν ἐμὸν μὲν ἔχει νόον ἐν φυλακῇσιν,
τόν δ' αὐτοῦ ἴδιον οὐδὲν ἐπιστρέφεται.

3. κρέας. The plural κρέατα is cited as occurring only in Hesychius; it is, however, found in *Odys.* 3. 33 (accor-

ding to the reading of Bekker, Ameis and Merry after La Roche):

δαίτ' ἐντυνόμενοι κρέατ' ὤπτων ἄλλα τ' ἐπειρον.

4. *πηρός*. The meaning 'blind' should be added. It occurs in *Æsop.* 17: ἀνὴρ πηρός εἰώθει πᾶν τὸ ἐπιτιθέμενον εἰς τὰς αὐτοῦ χεῖρας ζῶον ἐφαπτόμενος λέγειν ὁποῖόν τι ἐστι, κ. τ. λ., and probably also in the well-known passage, *Il.* 2. 599:

αἱ δὲ χολωσάμεναι πηρὸν θέσαν, αὐτὰρ ἀοιδὴν
θεσπεσίην ἀφέλοντο καὶ ἐκλέλαθον κιθαριστὴν.

5. *Κυψελίζω*. This verb, occurring in *Theogn.* 890, should be given. It is interesting as being, in common with *φιλιππίζω*, one of the very few verbs of this form derived from the proper name of an individual; though such verbs as *μηδίζειν*, *λακωνίζειν*, *βιοιωτιάζειν*, from national names, are common.

6. *ἐγγώνιος* is erroneously derived from *γῶνος*. It should be referred to *γωνία*.

7. *εἴσω* is said to follow its case everywhere, except in *Il.* 21. 125, *εἴσω ἀλὸς εὐρέα κόλπον*. Other instances, however, occur of this preposition preceding its case; *e. g.* *Il.* xxiv. 184:

αὐτὰρ ἐπὴν ἀγάγησιν ἔσω κλισίην Ἀχιλῆος, κ. τ. λ.

Id. 199:

κεῖσ' ἰέναι ἐπὶ νῆας ἔσω στρατὸν εὐρὺν Ἀχαιῶν.

8. *ἀζήμιος*, in *Thuc.* 2. 37, is explained as '*act.* not amounting to punishment, harmless, of sour looks'; but Mr. Tyrrell long since pointed out the true meaning: 'we do not wear those sour looks, which, *though there is no fine attached to them*, morally constitute an affront.' The passage is οὐδὲ ὀργῆς τὸν πέλας εἰ καθ' ἡδονὴν τι δρᾷ ἔχοντες, οὐδὲ ἀζημίους μὲν λυπηρὰς δὲ τῇ ὄψει ἀχθηδύνας προστιθέμενοι.

9. *τριπέδων*. The misprint, 'a slave who has been *twice* in fetters' instead of *thrice*, is still retained from preceding editions.

Mr. Tyrrell has pointed out to me that the translation of the first passage cited above from *Theognis* contains a further error, as the words *κακός* and *ἰσθλός* are not used in the moral sense, but should be translated, respectively, 'low-born' and 'well-born'.

I am also indebted to Mr. Tyrrell for the following corrections:—

φυλακή. To the meanings of this word given in the Lexicon should be added 'gag', which occurs in the *Persae*, 591:—

οὐδ' ἔτι γλῶσσα βροτοῖσιν
ἐν φυλακαῖς

and in the *Agamemnon*, 234:

στόματός τε καλλιπρέπου φυλακὰν κατασχεῖν φθόγγον
ἄραϊον οἴκοις
βίᾳ χαλίνων τ' ἀναύδῃ μένει.

ἄκληροι, in *Troades* 32, should be translated 'unballoted for', not 'unallotted, without an owner', as given in the Lexicon.

Under *κλείς* '*κλήδας* = *sacred chaplets* in *Troades* 257' should be added.

σελᾶναι, in *Troades* 1075, should be explained 'monthly festivals'.

σκόλοψ, in *Bacchae* 983, should be translated 'date palm'. The translation 'a tree', given in the Lexicon, although an improvement on previous editions, is too indefinite.

CHARLES H. KEENE.

ON THE MEASURE OF TIME.

THE question of the Measure of Time is one of those which, lying like that of the Axioms of Geometry on the border land between Science and Philosophy, possess at once a peculiar interest and present special difficulties. On the one hand, the many important verified results obtained in Science, more especially in the Science of Astronomy, on the assumption of the existence of such a measure, compel us to believe that it exists and has an intelligible meaning; on the other, when we view the matter from the subjective or philosophic standpoint, it is not easy at first sight to say what that meaning is.

The question is considered, but in an imperfect form, in Locke's Essay, B. II. chap. xiv. § 21, where he dwells at some length on the point that 'no two parts of duration can be certainly known to be equal.'

Here it is to be noted that the meaning of the equality of different times is pre-supposed, the difficulty of the problem being conceived to lie only in ascertaining the fact that two different times are equal according to this meaning. In truth, however, the gist of the problem lies in the determination of this very meaning, in other words, in defining the conception of equality as applied to time. In 'equal' and 'equality' we have in fact a striking instance of that ambiguity and vagueness in 'notionibus logicis et physicis' of which Bacon complained. We are apt to imagine that to the one term answers one uniform conception which, though requiring different modes of ascertainment in different subject-matters, is yet itself one and the same

throughout. Reflection, however, soon shows us that this is not so. Equality is a notion which, so far from being one and the same, requires special definition for the purposes of each special science,¹ this definition, indeed, or its synonym, that of measure, forming the first step by which the science as quantitative is rendered possible. Thus, as Aristotle explained the oneness of the 'good' as consisting in its being always the end in the different sciences, so we might consider that implied in 'equality' as based on its always constituting from another point of view their starting point.

How then are we to define this notion in the case of time?

Turning again to Locke, we are referred by him for answer to the train of our Ideas. 'The constant and regular succession of Ideas in a waking man is,' he asserts, 'the measure and standard of other successions.'

The same view is also expressly laid down by him at the close of the passage from which I cited before :—

'All that we can do for a measure of time is to take such as have continual successive appearances at seemingly equidistant periods, of which seeming equality we have no other measure but such as the train of our own ideas have lodged in our memories, with the concurrence of other probable reasons to persuade us of their equality.'

Now I think it cannot be denied that it is from the succession in the mental train that we obtain the subjective significance, or what I may term the qualitative idea of duration; but I think it is equally clear that this succession, varying as it does, not only with different individuals, but

¹ Even within the limits of the single science of Geometry, the equality which is defined by coincidence is distinct from that defined by addition or subtraction of coincident parts, *e.g.* the equality of

the triangles in Eucl. I. 37, cannot be reduced to the equality of Eucl. I. 4.

And when we come to the doctrine of ratio, a new definition is again required.

even with the same individual at different times, must be quite incapable of furnishing an objective or quantitative measure.

That this difficulty was felt by Locke, is apparent from the 'odd conjecture' which he saw to be essential to his theory—that of a normal degree of quickness in the train of ideas. The facts, however, which he adduces in support of this conjecture are at best such as to establish a qualitative result only, viz., that the succession of ideas is variable as to rapidity between certain extreme limits, not that it is rigorously uniform. Indeed the readiness with which Locke satisfies himself on this point, seems to show that he had formed no adequate conception of the requirements of a definition which is to serve as a basis for science.

He proceeds in fact as one who should attempt to estimate degrees of heat by actual sensation in place of a thermometer.

There are, moreover, other difficulties in this view which Locke has failed to solve. Thus, what is to be taken as the unit of measurement?—is it the interval between two ideas, or the time occupied by a single idea, or are these two the same? or, indeed, if Hobbes' '*idem sentire est nil sentire*' be true, does this latter time at all exist?

The succession of ideas thus failing us, can we have recourse to the geometric conception of equality—coincidence?

This, indeed, is free from the difficulty of the other, being at once objective and susceptible of exact determination. And to a certain degree it may, and indeed does, serve as a definition. Thus the lapse of time here or in India, or in the experience of two different individuals here, may be defined as equal when begun and terminated by the same limits. (I may note in passing that this appears fatal to the Lockian definition, which can only be reconciled with it on the supposition of some impossible *φρό-*

νῦμος or individual of regulated ideas who may serve as standard.) Nay, further, we may by the application of this test distinguish between the lengths of different intervals in a time succession, provided we have a standard succession with which to compare it, in which the intervals are assumed equal.¹

But the fundamental question remains, how is this equality itself determined—how are we to define ultimately equality of successive parts of time where the resource of coincidence fails us?

Perhaps the *solvitur ambulando* method may here come to our aid.

We at least affect to measure equal intervals of time. How then do we do it?

Fundamentally all methods made use of for this purpose will be found to rest on the description of equal spaces by a body in motion, the equality of the times of describing these spaces being then inferred from the principles of Kinetics. These, again, rest ultimately on the three laws of motion enunciated by Newton. Omitting the third as not relevant to our present purpose, these are the following:—

I.—Every body continues in its state of rest or uniform motion in a right line, except in so far as it may be compelled by impressed forces to change that state.

II.—Change of motion is proportional to the impressed force, and takes place in the direction of the straight line in which the force acts.

Of these laws, the second evidently falls back on the first, as that in which the conception of velocity, and therefore of a time measure, is first introduced.

¹ This seems all that is put forward by Mill in solution of the problem. See Exam. of Hamilton, Note, p. 253, 5th Edition.

It would appear then that, since this axiom is the primary basis of the whole Science of Kinetics, we must seek in it the definition we are in quest of.

At first sight, however, it would seem that this can only be effected at the expense of the law itself, which could then be regarded as such only by a vicious circle. The law, it may be said, professes to assert that equal spaces are described in equal times by a body under the action of no force, while yet equal times are defined no otherwise than as those in which a body so circumstanced describes equal spaces.

It is, however, easy to show that this difficulty may be overcome, the law being so stated as to enounce a physical fact not itself dependent on a measure of time, and therefore capable of furnishing such a measure.

Thus, conceive a perfectly smooth horizontal surface on which different bodies are simultaneously projected in varying directions and with different degrees of force.

Then the first law of motion may be thus enunciated:—

‘Let, for one of these bodies, A , A' , A'' , denote successive positions separated by equal space-intervals, and let B , B' , B'' , be synchronous positions of any other, then B , B' , B'' , are likewise separated by equal space-intervals.’ This law once established, any one of these bodies may be used to serve as a measure of time by its description of equal spaces. The law then assures us that the measure is a valid one, *i.e.* that two times estimated as equal by reference to the motion of one body would be so likewise when estimated with reference to any other.

In practice the measure commonly adopted is not that here supposed, but the swing of a pendulum, the equality of which involves the second law of motion as well as the first. This, however, is immaterial to the theory, the ultimate basis being the first law, and the second only serving the convenient practical purpose of substituting a

periodic motion between fixed limits for one continually progressive. In fact, it was not by direct, but by pendulum experiments, that the truth of the first law was itself established.

In conclusion, I may remark—(1). If this theory be true, we have here another instance of that dependence of the form of time on that of space to which Kant frequently directs our attention. Space, in fact, here as elsewhere, appears as the principle of objectivity or of the comparison of different perceptions. (2). That the measure of time, being derived from the laws of motion, requires some process in which motion is involved. This is contrary to Locke's view, who held that the celestial measures of time were based, not on the motion, but on the periodical appearances of the luminaries. It is, of course, true that it is by no means necessary that this motion should be perceived; but, unless it be believed to exist, we have no objective law such as is supplied by the '*leges motus*,' in virtue of which the intervals between these periodic appearances can be pronounced equal.

It is only right to add, that since writing the above I have ascertained that the view I have taken of the First Law of Motion as the true base of a measure of time is to be found clearly stated in Thomson and Tait's *Nat. Philosophy*, vol. i., pp. 179, 180; 1st ed. In this respect, therefore, though not consciously indebted to that work, I can, of course, claim no originality for the present note.

It seemed to me, however, that it might still be of some service in directing attention to the philosophic aspect of an interesting problem considered there only in a scientific point of view.

F. PURSER.

ON THE SUPERFICIAL AREA OF AN ELLIPSOID.

I HAVE shown (*Liouville, Journal de Mathématiques*, tom. xviii. p. 166) that the superficial area of a closed surface is given by the integral

$$S = \frac{1}{2} \iint P \left(\frac{1}{R} + \frac{1}{R'} \right) dS,$$

where P is the perpendicular from the origin on the tangent plane, and R, R' are the principal radii of curvature; dS being the element of the superficial area, and the integration being extended through the whole surface.

Applying this expression to the case of an ellipsoid: let A, B , be the axes of the central section whose plane is parallel to the tangent plane, and r the central radius vector of the ellipsoid perpendicular to this plane. Then it is known that

$$\frac{1}{R} = \frac{P}{A^2}, \quad \frac{1}{R'} = \frac{P}{B^2},$$

and that

$$\frac{1}{A^2} + \frac{1}{B^2} + \frac{1}{r^2} = \frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}.$$

Hence

$$S = \frac{1}{2} \iint P^2 \left(\frac{1}{A^2} + \frac{1}{B^2} \right) dS = \frac{1}{2} \iint P^2 \left(\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} - \frac{1}{r^2} \right) dS.$$

Let θ, ϕ be the angles which determine the position of P or r . Then

$$dS = \frac{a^2 b^2 c^2}{P^4} \sin \theta d\theta d\phi,$$

$$P^2 = a^2 \sin^2 \theta \cos^2 \phi + b^2 \sin^2 \theta \sin^2 \phi + c^2 \cos^2 \theta,$$

$$\frac{1}{r^2} = \frac{\sin^2 \theta \cos^2 \phi}{a^2} + \frac{\sin^2 \theta \sin^2 \phi}{b^2} + \frac{\cos^2 \theta}{c^2},$$

whence $S = \frac{1}{2}a^2b^2c^2 \left\{ \left(\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} \right) I - I' \right\}$, where

$$I = \int_0^\pi \int_0^{2\pi} \frac{\sin \theta d\theta d\phi}{a^2 \sin^2 \theta \cos^2 \phi + b^2 \sin^2 \theta \sin^2 \phi + c^2 \cos^2 \theta}$$

$$I' = \int_0^\pi \int_0^{2\pi} \left(\frac{\frac{\sin^2 \theta \cos^2 \phi}{a^2} + \frac{\sin^2 \theta \sin^2 \phi}{b^2} + \frac{\cos^2 \theta}{c^2} \right) \sin \theta d\theta d\phi.$$

Integrating the first with regard to ϕ between the limits 0 and 2π , we find

$$I = 2\pi \int_0^\pi \frac{\sin \theta d\theta}{\sqrt{(a^2 \sin^2 \theta + c^2 \cos^2 \theta)(b^2 \sin^2 \theta + c^2 \cos^2 \theta)}};$$

or, putting $a^2 - c^2 = a^2 e^2$, $b^2 - c^2 = b^2 e^2$ $\cos \theta = x$.

$$I = \frac{2\pi}{ab} \int_{-1}^1 \frac{dx}{\sqrt{(1 - e^2 x^2)(1 - e'^2 x^2)}} = \frac{4\pi}{ab} \int_0^1 \frac{dx}{\sqrt{(1 - e^2 x^2)(1 - e'^2 x^2)}}.$$

Also,

$$\begin{aligned} I' &= \int_0^\pi \int_0^{2\pi} \frac{\left(\frac{1}{a^2} - \frac{1}{b^2} \right) \sin^2 \theta \cos^2 \phi + \frac{\sin^2 \theta}{b^2} + \frac{\cos^2 \theta}{c^2}}{(a^2 - b^2) \sin^2 \theta \cos^2 \phi + b^2 \sin^2 \theta + c^2 \cos^2 \theta} \sin \theta d\theta d\phi \\ &= \int_0^\pi \int_0^{2\pi} \left\{ -\frac{1}{a^2 b^2} + \frac{\left(\frac{1}{b^2} + \frac{1}{a^2} \right) \sin^2 \theta + \left(\frac{1}{c^2} + \frac{c^2}{a^2 b^2} \right) \cos^2 \theta}{(a^2 \sin^2 \theta + c^2 \cos^2 \theta) \cos^2 \phi + (b^2 \sin^2 \theta + c^2 \cos^2 \theta) \sin^2 \phi} \right\} \sin \theta d\theta d\phi \\ &= -\frac{4\pi}{a^2 b^2} + 2\pi \int_0^\pi \frac{\frac{1}{b^2} + \frac{1}{a^2} - \left(\frac{1}{b^2} + \frac{1}{a^2} - \frac{1}{c^2} - \frac{c^2}{a^2 b^2} \right) \cos^2 \theta}{\sqrt{(a^2 \sin^2 \theta + c^2 \cos^2 \theta)(b^2 \sin^2 \theta + c^2 \cos^2 \theta)}} \sin \theta d\theta \\ &= -\frac{4\pi}{a^2 b^2} + \frac{4\pi}{ab} \int_0^1 \frac{\left(\frac{1}{b^2} + \frac{1}{a^2} + \frac{e^2 e'^2 x^2}{c^2} \right) dx}{\sqrt{(1 - e^2 x^2)(1 - e'^2 x^2)}}. \end{aligned}$$

Hence

$$\left(\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} \right) I - I' = \frac{4\pi}{a^2 b^2} + \frac{4\pi}{ab c^2} \int_0^1 \frac{(1 - e^2 e'^2 x^2) dx}{\sqrt{(1 - e^2 x^2)(1 - e'^2 x^2)}},$$

and
$$S = 2\pi c^2 + 2\pi ab \int_0^1 \frac{(1 - e^2 e'^2 x^2) dx}{\sqrt{(1 - e^2 x^2)(1 - e'^2 x^2)}}.$$

If the surface be a prolate spheroid,

$$b = c, \quad e' = 0,$$

and the expression becomes

$$S = 2\pi b^2 + 2\pi ab \int_0^1 \frac{dx}{\sqrt{1 - e^2 x^2}} = 2\pi b \left(b + \frac{a}{e} \sin^{-1} e \right).$$

If the surface be an oblate spheroid,

$$a = b, \quad e = e',$$

and the expression becomes

$$\begin{aligned} S &= 2\pi c^2 + 2\pi a^2 \int_0^1 \frac{1 - e^4 x^2}{1 - e^2 x^2} dx \\ &= 2\pi^2 c + 2\pi a^2 \int_0^1 \left(e^2 + \frac{1 - e^2}{1 - e^2 x^2} \right) dx \\ &= 2\pi c^2 + 2\pi a^2 e^2 + 2\pi a^2 (1 - e^2) \int_0^1 \frac{dx}{1 - e^2 x^2} \\ &= 2\pi \left(a^2 + \frac{c^2}{2e} \log \frac{1 + e}{1 - e} \right). \end{aligned}$$

JOHN H. JELLETT, D. D.

SIR WILLIAM ROWAN HAMILTON ON THE
PROBLEM OF HIPPARCHUS.

To the Editor of 'HERMATHENA.'

MY DEAR SIR,

Among the papers of Sir W. Rowan Hamilton which are in my hands, I find two bearing titles connecting them with *The Problem of Hipparchus*. They are incomplete; but I send them for your perusal, thinking that they may be deemed by you suited to publication in the pages of 'HERMATHENA'.

In sequence with them is a manuscript book containing an extended discussion of a problem of Snellius, 'having much affinity to' that of Hipparchus, but which, in contradistinction to the astronomical character of the latter, is called by Sir William Hamilton a *geodetical* problem; the distances from the observer to the things observed being what was sought, instead of the central point of the excentric or epicycle.

Sir William Hamilton took much delight in studying the *Almagest* of Ptolemy, and expressed admiration of his mathematical powers, and of the justice done by him to the astronomical discoveries of his predecessor Hipparchus. The papers I send may be regarded as evidencing the Author's respect for these ancient men of science, and also possess an interest as exhibiting Hamilton at work upon matter strictly astronomical, instead of on the higher mathematics, which more generally occupied his attention. I may remark, however, that he considered himself, by his *Essay on Dynamics*, as well as by other scientific memoirs,

to have earned a place in the history of Physical Astronomy, and not to have been, as by some he has been thought to be, an originator only in the region of pure mathematics.

I am able to report that Dr. Ball, our present Royal Astronomer, is of opinion that value, both intrinsic and personal, attaches to these papers of Hamilton; and I may add my belief, that an examination by competent persons of the scientific manuscripts of Hamilton in my hands and in the Library of Trinity College, would not improbably be rewarded by the discovery of other unpublished work that ought to be rescued from oblivion. I have heard with great satisfaction that such an examination is contemplated by the authorities of the University: it would give me pleasure to contribute towards it every facility in my power.

I remain,

Very faithfully yours,

R. P. GRAVES.

1, WINTON-ROAD, DUBLIN,

7th July, 1883.

REMARKS, CHIEFLY ASTRONOMICAL, ON WHAT IS KNOWN AS THE PROBLEM OF HIPPARCHUS.

§ I.—*On the Mean Motions of the Sun and Moon, as determined by Hipparchus, and recorded in the Almagest of Ptolemy.*

1. Hipparchus¹ estimated the length of the tropical year as falling short, by one day in three hundred years, of the old approximate amount, best known to us as the Julian,

¹ See Halma's edition of the *Almagest*, Paris, tome i. page 164, to which work other references shall be made,

sometimes by tome and page, at other times by book and chapter, or by both.

of 365 days and a-quarter. He therefore conceived that 300 revolutions of the sun in longitude occupied

$$300 \times 365 + 75 - 1 = 109574 \text{ days;}$$

or that 150 tropical years were = 54787 days; whence the mean daily motion of the sun in longitude is

$$\frac{150 \times 360^\circ}{54,787} = 0^\circ 59' 8'' 17''' 13^{iv} 12^v 31^{vi},$$

as, in fact, he found³ it to be, though probably by a very different arithmetic.

2. Astronomers before Hipparchus—οἱ ἔτι παλαιότεροι, as described by Ptolemy²—namely, the Chaldeans, as is commonly supposed, or the Greeks, perhaps Meton, as is conjectured by Delambre,⁴ who, in the absence of evidence in their favour, is not disposed to concede even so much of accurate and mathematical knowledge to the Chaldeans as would be involved in their understanding what goes to the name of their own *Saros*,⁵ had conceived that in a certain *Period* of a little more than 18 years, but more exactly in one of 6585½ days,⁶ the following lunar revolutions were accomplished. The moon had gained (it was supposed) 223 circumferences on the sun, or had performed 223 complete lunations, by having described 241 circumferences of the ecliptic, with a surplus of about 10° 40', as compared with the *fixed*⁷ stars (πρὸς τοὺς ἀπλανεῖς ἀστέρας), while the sun had described only 18 circumferences, with the same sidereal surplus. In this interval it was thought

³ *Almagest*, tome i. p. 166, Book iii. chap. ii. (μοιρῶν δ' νθ' η' ιζ' ιγ' ιβ' λα' γ' γ' α').

⁴ *Alm.*, tom. i. p. 215, book iv., chap. ii.

⁵ *Hist. of Anct. Astry.*, by Delambre,

tome ii., Paris, 1817, p. 144. This volume will for the present be referred to simply as 'Delambre.'

⁶ Brinkley's *Astronomy*, &c.

⁷ Ptolemy, vol. i. p. 216.

⁸ *Ibid.*

that the moon had gone 239 times through her known⁸ alternations of slow and quick motion in longitude, or had described 239 revolutions with respect to its (variable) place of slower motion, as referred to the ecliptic; or had accomplished 239 *restitutions of anomaly*.

It was believed also by some astronomers *before* Hipparchus, that in the same *period*, called the Chaldean, and which, in fact, the Chaldean observers are likely enough to have *recognized* at Babylon, as approximately bringing back *eclipses* of the moon (whether they knew, or even *suspected*, anything of all these *mathematical* conceptions of the lunar motions, more probably due to the Greeks), that the moon accomplished 242 *restitutions of latitude*,⁹ or (as we should now express it) performed 242 complete revolutions with respect to its ascending *node*; the node (as we should now say) having thus *regressed once* ($242 - 241 = 1$) in the course of the Chaldean Period.

3. It could not, of course, have been with any hope of improving the astronomical *accuracy*, but only of increasing the arithmetical *convenience* of such determinations as these, that some astronomer (perhaps Meton) before Hipparchus (one of the 'yet more ancients' already referred to, as mentioned by Ptolemy in the *Almagest*) proposed to *triple*¹⁰ *all* the numbers, for the sake of escaping from fractions. It had thus been collected, as a mere numerical inference from former results, that in a certain longer period, called 'Εξελιγμός (= Evolution), consisting of 19756 days, the moon performed 669 lunations, or gained 669 circumferences on the sun; the moon describing 723 times the ecliptic, but the sun only 54 times, with a common

⁸ Delambre doubts whether the Chaldeans had ever noticed these variations in the longitudinal motion of the moon at all; and indeed the discovery of them, but still more any

theory to account for them, seems more likely to be due to the Greeks (Delambre ii. p. 143).

⁹ Ptolemy, vol. i. p. 216.

¹⁰ *Ibid.*

sidereal surplus of 32° . The moon was also calculated to make, in the same tripled period, or '*Exeligm*,' of 19756 days, 717 restitutions of anomaly, and 726 restitutions of latitude. But all these estimates, though originally not quite useless, came to be set aside by Hipparchus, in his deeper study of the subject.

4. In their stead, Hipparchus introduced into the theory of the moon's mean motions *two other principal periods*: one relating chiefly to the 'restitution of the anomaly,' but involving also means for a more accurate determination of the mean returns of the moon to the sun, or of the length of a mean lunation; and the other referring to what was called (as above mentioned) the 'restitution of the latitude.' The *first*, or *anomalistic period*, of Hipparchus consisted, according to Ptolemy, of 126,007 days and *about* an hour.¹¹ Ptolemy does not even insert, in his mention of it, as regards the surplus *hour*, the usual *ἑγγίστα*, but I find myself obliged to believe that Hipparchus had designed this period to consist, *very exactly*, of 126,007 days, one hour, five minutes, and three and one-third seconds, such as those by which we now count time; and that Ptolemy suppressed the five minutes odd, as being of very slight astronomical importance in a period of about 345 tropical years; though I find myself obliged to *restore* this trifling surplus, in so long an interval, as what appears to me a *correction* of the *lost text* of Hipparchus, on this particular subject, as reported in the *Almagest*; because thus, and thus only, I can recover by calculation the *mean motions* there recorded, to the very *sixth* of the sexagesimal division. Be that as it may, from the comparison of ancient Babylonian eclipses of the moon with others observed, some centuries later, by himself, Hipparchus inferred that in his first period, of about 126,007 days, the moon accom-

¹¹ Ptolemy, vol. i. p. 216.

plished 4573 restitutions of anomaly, and 4267 complete lunations; having described the ecliptic 4612 times, with a defect of about $7\frac{1}{2}^\circ$, as compared with the fixed stars, inclination being *here* neglected; while the sun had only moved through 345 circumferences, with the same sidereal deficiency. His *second*, or *latitudinal* period, after which the lunar eclipses were observed to return with nearly the same *magnitudes* as before, consisted of 5458 lunations,¹² wherein the moon was found by him to accomplish 5923 restitutions of latitude, or revolutions with regard to its regressing node.

5. If we divide the period of 126,007 days and an hour by the number, namely 4267, of lunations which it was found to contain, we shall obtain a quotient which exceeds

$$29^d \ 12^h \ 44^m \ 3^s,$$

by somewhat more than a quarter of a second of time. But whether it were that Hipparchus suspected that the surplus *hour* of his first period required to be a little increased, or merely that he wished to combine, with a sufficient accuracy of determination, a more manageable expression, he adopted (what with our division of the day is equivalent to) the *exact third part of a second*, as what was to be added to the approximate quotient above mentioned. His adopted value of the *mean lunation* was then, in our notation, exactly

$$29^d \ 12^h \ 44^m \ 3\frac{1}{3}^s;$$

or in his more *purely sexagesimal*¹³ *division of the day*,

$$29^d + \frac{31^d}{60} + \frac{50^d}{60^2} + \frac{8^d}{60^3} + \frac{20^d}{60^4};$$

the *hour* of the period coming thus to be increased, as I

¹² Ptolemy, vol. i. p. 216.

¹³ Ptolemy, vol. i. p. 223.

have already said, by $5^m 3\frac{1}{2}^s$, in above 345 years. In vulgar fractions, each expression becomes,

$$\text{Mean lunation} = 29^d \frac{13754}{25920} = \frac{765433^d}{12^s.15}.$$

6. Dividing the whole circumference by this number of days (and fractions of a day) in the mean lunation, I find:

Mean daily motion of the moon, in *elongation* from the sun,

$$\begin{aligned} &= \frac{25920 \times 360^\circ}{765433} = 12^\circ 11' 26'' 41''' 20^{iv} 17^v 59^{vi} \\ &= 568771489079^{vi}. \end{aligned}$$

And adding to this quantity, the

$$59' 8'' 17''' 13^{iv} 12^v 31^{vi},$$

which were found, in Art. 1, to be the mean daily motion of the sun, we obtain,

Mean daily motion of the moon in *longitude*,

$$= 13^\circ 10' 34'' 58''' 33^{iv} 30^v 30^{vi}.$$

And such are *precisely* the results of Hipparchus, respecting the mean motions of the moon in elongation and in longitude, as recorded in the *Almagest*¹⁴ of Ptolemy.

(ἔξομεν ἀποχῆς μέσον ἡμερήσιον κίνημα, μοίρας ιβ' ια' κς'' μα''' κ''' ιζ'''' νθ''''' ἔξομεν ἡμερήσιον μέσον κίνημα μήκους, μοίρας ιγ' ι' λδ'' νη''' λγ'''' λ''''' ἐγγίσα).

7. In the anomalistic period of 126,007 days, Hipparchus had found (Art. 4) that there were 4573 restitutions of the moon's anomaly, but only 4267 returns to opposition with the sun: the mean motion in anomaly was, therefore, concluded to be more rapid than the mean motion in

¹⁴ Ptolemy, vol. i. p. 223.

elongation, in the ratio of 4573 to 4267, or of 269 to 251. Increasing, therefore, the last-mentioned motion in this ratio, I find :

Mean daily motion of the moon in *anomaly*,

$$\begin{aligned}
 &= \frac{269}{251} \times 568,771,489,079^{\text{v}} = 609,559,882,718^{\text{v}} \\
 &= 13^{\circ} 3' 53'' 56''' 29^{\text{iv}} 38^{\text{v}} 38^{\text{vi}};
 \end{aligned}$$

and such, to the very *sixth*, is the result¹⁵ of Hipparchus (ἔξομεν καὶ ἀνωμαλίας ἡμερήσιον μέσον κίνημα, μοίρας ιγ γ' νγ'' νς''' κθ''' λη'''' λη'''''). And by subtracting this mean motion in *anomaly* from the mean motion in *longitude*, namely, from 13° 10' 34'' 58''' 33^{iv} 30^v 30^{vi}, we obtain :

Mean daily *progression* of the moon's *apogee*,

$$= 0^{\circ} 6' 41'' 2''' 3^{\text{iv}} 51^{\text{v}} 52^{\text{vi}};$$

the word 'apogee' being here used unhypothetically, to express merely that variable and progressive point of the ecliptic where the moon was observed to move most slowly in longitude.

8. Finally, the latitudinal period of 5458 lunations, with 5923 restitutions of latitude, gives, in exact agreement with what Hipparchus determined it to be,¹⁶

Mean daily motion of the moon with respect to its ascending *node*,

$$\begin{aligned}
 &= \frac{5923}{5458} \times 568,771,489,079^{\text{v}} = 617,228,569,039^{\text{v}} \\
 &= 13^{\circ} 13' 45'' 39''' 40^{\text{iv}} 17^{\text{v}} 19^{\text{vi}}.
 \end{aligned}$$

(ἔξομεν καὶ πλάτους ἡμερήσιον μέσον κίνημα μοίρας ιγ ιγ' με' λθ''' μ''' ιζ'''' ιθ''''').

Whence, by subtracting the mean motion of the moon

¹⁵ Ptolemy, vol. i. p. 223.

¹⁶ *Ibid.*

in longitude, it may be inferred, as a consequence of the foregoing data, that

Mean daily *regression* of the moon's *node*,

$$= 0^{\circ} 3' 10'' 41''' 6^{iv} 46^v 49^{vi}.$$

But of course all these results have merely an *arithmetical* accuracy, as being consistent among themselves, and cannot be relied on as astronomically correct, to anything like the extent to which they have been developed.

9. As regards the *node*, I may remark that Hipparchus's ratio of 5923 to 5458 is very nearly the same as that of 777 to 716, which many years ago occurred to me, from more modern data, as approximately expressing the rate of the moon's mean gain upon its ascending node, as compared with its mean gain upon the sun, and which I have often found useful in the mental or approximate calculation of the returns of eclipses of the moon. Let the arc $\frac{\pi}{358}$, which is little more than half a degree, be called, for conciseness, a *moon-breadth* (or sometimes simply a 'moon'); then, in *one* mean lunation, one satellite, on an average, overtakes a given (say the ascending node), and passes it by 61 'moon-breadths'; that is, by about a sign of the zodiac, rendering thus the return of a lunar eclipse impossible, after so short an interval. After *six* lunations, supposed, for simplicity, to commence with the moment of one central and total eclipse in the ascending node, the moon has gained $6 \times 61 = 366$ moon-breadths on that node, or has passed the *opposite* (the descending node), by $366 - 358 = 8$ such parts, = about 4 degrees, rendering thus the return of an eclipse *certain*. After 12 lunations, or one *lunar year*, the moon has passed the original node by 16 moon-breadths (of the kind above described), = about 8 degrees, and an eclipse must again take place. After 18 lunations the opposite node is passed

by 24 such spans: after 24 lunations the original node is passed by 32 moon-breadths, and no eclipse can take place. After 48 lunations the excess on the first node amounts to 64 such parts; and therefore (subtracting 61), after 47 lunations, the excess is only 3 parts (moon-breadths), and a great eclipse is certain to recur. After $141 = 3 \times 47$ lunations the surplus on the original node amounts to $3 \times 3 = 9$ parts; and, therefore, subtracting 6 from the number of lunations, and 8 from the number of parts, and changing the node, the moon is found to be only 1 moon-breadth advanced beyond the opposite node, after 135 lunations; which interval is therefore a pretty good *period* of eclipses of the moon, so far as mere *nodations* are concerned. The (so-called) Chaldean Saros is a sort of *complement* of this little period; for in 358 lunations there are (according to the approximations here adopted) 777 *semi-nodations*, bringing thus the moon to the opposite node; subtracting, therefore, 135 from 358, and 1 from 0, and again reversing the node, we find that in 223 lunations the mean moon *falls short* of returning to its *original* node by about *one* moon-breadth. All this I have occasionally lectured on.

§ II.—On Hipparchus's Hypothesis of the Excentric

10. Such being the chief *mean motions* (ὁμαλαὶ κινήσεις) of the sun and moon, as determined by Hipparchus, we have next to consider the *hypotheses* by which he sought to account for, and reduce to calculation, the apparent inequalities (ἀνωμαλῖαι) of the observed motions of those two bodies. Plato is reported by Delambre¹⁷ to have laid down the principle, that the object of mathematicians ought to be to represent all the celestial phenomena by

¹⁷ Delambre, vol. ii. p. 113.

uniform and circular motions. (. . . . Ptolémée, pour suivre le principe de Platon, que l'objet des mathématiciens doit être de représenter tous les phénomènes célestes par des mouvements circulaires et uniformes,). The *principle* is worthy of Plato, and I agree with Moebius¹⁸ and with Laplace in considering that it is only in *appearance* obsolete; but I regret to be obliged to confess that I know not *where*, in Plato's works, the enunciation of it is to be found. In the *Almagest* it is thus laid down, as having been at least *adopted* by Ptolemy¹⁹:—*πρόθεσιν μὲν καὶ σκοπὸν ἡγοῦμεθα δεῖν ὑπάρχειν τῷ μαθηματικῷ δεῖξαι τὰ φαινόμενα ἐν τῷ οὐρανῷ πάντα, δι' ὁμαλῶν καὶ ἐγκυκλίων κινήσεων ἀποτελούμενα,* The author of the *Almagest* had, however, the advantage of the example of his great master, Hipparchus, whom he is never weary of praising as 'a labour-loving and truth-loving man,' *ανηρ φιλοπονός καὶ φιλαληθής*; and whom we too must reverence (in this nineteenth century of Christ), as the true founder of modern astronomy: ancient, indeed, if 2000 years can make him such, but not less *modern*, in a deeper sense, than Thucydides. Between Hipparchus and all known predecessors of his in astronomy the difference is one of *kind* rather than of degree. Compared with *him*, the Chaldeans, for instance, remind one of those children at play on the woody banks of the Orinoko, who were found by Humboldt rubbing the dry, flat, and shining seeds of a creeping leguminous plant (he thought it might be the negretia) until they attracted fibres of cottonwool and chips of the bamboo, and thus *exemplified* 'electricity by friction,' without having even *begun* to *theorize* upon the subject.

11. Hipparchus selected the very simple and natural conception of which he seems to have been, in the strictest sense, the author, and which Ptolemy scarcely improved

¹⁸ Die Mechanik des Himmels.

¹⁹ Ptolemy, vol. i. p. 165.

by a modification proposed by himself—that the sun and moon moved each in a certain ‘*excentric circle*’ of its own, and that each described its own excentric *uniformly*. More precisely (see earlier articles of this little Paper), he conceived that the *sun’s* excentric circle was *fixed* with respect to the equinoctial points; for he had failed, and so did Ptolemy, to detect any progression of the sun’s apogee in longitude, which is no way to be wondered at, though the precession of the equinoxes was one of the many discoveries of Hipparchus; and he regarded the sun as describing its excentric at the uniform rate of $59^{\circ} 8' 17''$. . . for each mean solar day. The *moon’s* excentric was conceived by him to be described also uniformly, but at the greater mean daily rate of about $13^{\circ} 3' 54''$ (Art. vii.), from apogee to apogee; while the lunar apogee itself, or rather the projection of the apogee diameter of the moon’s orbit on the plane of the ecliptic, had a mean daily progression of about $6' 41''$ in longitude. Hipparchus thus regarded the apparent *anomalies* of the observed motions of the sun and moon as phenomena purely *optical*; and doubtless it was right to *try this* mode of explanation before seeking for any more refined one. That it is insufficient *we*, with the help of telescopes, can very easily establish. For it would have given, in the theory of the sun, the equality which we *now* know *not* to exist:

Spring plus autumn = summer plus winter;

if by the word ‘spring,’ as denoting an *interval*, be understood the time elapsed between the vernal equinox and the summer solstice; and similarly in the other cases. Hipparchus, however, supposed the equality to hold good; for he estimated the spring quarter of the year as $= 94\frac{1}{2}$ days; the summer quarter as $92\frac{1}{2}$ days; and deduced by a *calculation* to be soon explained:

Autum quarter = nearly $88\frac{8}{10}$ days (ἐν ἡμέραις πῇ καὶ η'),
and

Winter quarter = nearly $90\frac{8}{10}$ days (ἐν ἡμέραις ζ καὶ η');

the favourite 'à peu près,' or ἔγγιστα, being added. Indeed Hipparchus can have only considered these results as rough *approximations* to the truth; for they would have given the length of the tropical year

$$= 94\frac{1}{2} + 92\frac{1}{2} + 88\frac{8}{10} + 90\frac{8}{10} \text{ days} = 365\frac{4}{5} \text{ days};$$

whereas he was well aware (see Art. 1) that the surplus of the year was *less* than a *quarter* of a day.

12. To determine the *details* of the sun's apparently *anomalous* motion (περὶ τῆς τοῦ ἡλίου φαινομένης ἀνωμαλίας), Hipparchus rested his whole weight on those *two* determinations, which he had made with all the care in his power, and which Ptolemy, after more than two centuries, found himself unable to improve, of the lengths (in days) of the *two* intervals called lately 'spring' and 'summer.' Very rudely determined, no doubt, those intervals were; the observation of a solstice, even of the summer one, being still ruder in that age, and indeed essentially more difficult still, than that of an equinox. It would, therefore, be merely pedantic to attempt to improve, by a new calculation, on the numbers, $93^{\circ} 9'$, and $91^{\circ} 11'$, which Hipparchus estimated as expressing the arcs of *mean anomaly* (or of mean longitude) described by the sun during the spring and summer quarters of the year. The *first case*, therefore, of the

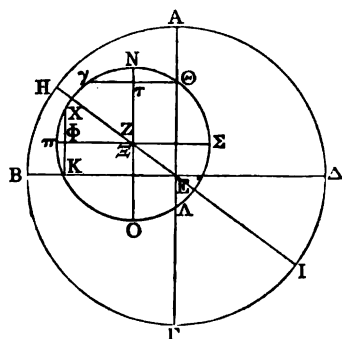
'Problem of Hipparchus,'

as actually and *historically* proposed and resolved by that great and venerable astronomer, consists in finding the *position of the excentric point* (the earth's centre) *at which two given consecutive arcs*, $93^{\circ} 9'$, and $91^{\circ} 11'$, *of a given circle*

(the sun's excentric) *shall subtend angles of 90° each*, with the same apparent directions of motion.

13. In a question of so great historical interest, I may be permitted to transcribe the diagram, which is preserved in the *Almagest* of Ptolemy.

In this diagram A, B, Γ , Δ represent the four points of the ecliptic (supposed to be *homocentric* with the earth), to which the observer at the point E refers the four places of the sun, at the moments of spring, summer,



autumn, and winter; their longitudes being 0° , 90° , 180° , and 270° . The centre of the sun's excentric circle is supposed to be Z; the apogee, as referred to the ecliptic, is H, and the perigee, so referred, is I; the true positions of the sun in its excentric, at the moments of spring, summer, and autumn, are conceived to be Θ , K, Λ ; the diameters NTZEO, and $\Pi\Phi\text{Z}\Sigma$, of the excentric are drawn parallel to the equinoctial and solstitial diameters of the eclipse, namely, A Γ and B Δ ; and to these are drawn parallel the chords of the excentric, X Φ K and YT Θ .

14. Hipparchus (as it has been said) adopted the values $93^\circ 9'$ and $91^\circ 11'$ for the arcs, Θ K and K Λ , of the excentric circle of the sun, as computed from the observed times elapsed, namely, as the arcs described between the ob-

served spring equinox, summer solstice, and autumn equinox, in virtue of the known (or assumed) rate of mean daily motion of the sun, which is a consequence of the assumed length of the tropical year. He had thus—

$$\begin{aligned} (\text{arc}) \quad \Theta Y &= \Theta N + O\Lambda = \Theta K + K\Lambda - NO \\ &= 93^\circ 9' + 91^\circ 11' - 180 = 4^\circ 20'; \end{aligned}$$

$$\begin{aligned} (\text{arc}) \quad XK &= \Theta K - \Theta X = \Theta K - K\Lambda \\ &= 93^\circ 9' - 91^\circ 11' = 1^\circ 58'. \end{aligned}$$

Hence, if the radius,

$$Z\Theta = ZN = ZY = Z\Xi = Z\Pi = ZK = ZO = Z\Lambda = Z\Sigma,$$

of the sun's excentric be taken for unity, we have nearly the numbers adopted by Hipparchus—

$$E\Xi = \Theta T = \frac{1}{2} \text{ chord } \Theta NY = \frac{1}{2} \text{ chord } 4^\circ 20' = \frac{2}{60} + \frac{16}{60^3};$$

$$Z\Xi = \Phi K = \frac{1}{2} \text{ chord } X\Pi K = \frac{1}{2} \text{ chord } 1^\circ 58' = \frac{1}{60} + \frac{2}{60^3};$$

which last numbers might, however, have been more accurately determined, at least by Ptolemy, from his Table of Chords in the *Almagest*, to have been, respectively—

$$E\Xi = \sin 2^\circ 10' = \frac{2}{60} + \frac{16}{60^2} + \frac{6}{60^3};$$

$$Z\Xi = \sin 0^\circ 59' = \frac{1}{60} + \frac{1}{60^2} + \frac{47}{60^3}.$$

15. As neither Hipparchus, nor even Ptolemy, possessed any Table of *Tangents*, the right-angled triangle was resolved by finding its *hypotenuse* on the famous Pythagorean principle. It having been estimated that (with $Z\Theta = \&c. = 1$),

$$3600. E\Xi = 136, \quad = 3600 \sin 2^\circ 10',$$

and

$$3600. Z\Xi = 62, \quad = 3600 \sin 59',$$

it was inferred that

$$3600. EZ = \sqrt{136^2 + 62^2} = 142\frac{1}{2}, \text{ very nearly, } = \text{nearly } 150;$$

whence $EZ = \frac{1}{24}$, nearly. In other words, he judged that the distance between the centre of the earth (E) and the centre of the sun's excentric (Z) equalled very nearly the 24th part of the radius of that excentric circle: whence he inferred that the greatest equation of the centre, or the greatest difference between mean and apparent longitude, was $(\sin^{-1} \frac{1}{24}) = 2^\circ 23'$. *This* result would not have been materially improved by using more accurate expressions for the sides about the right angle, $E\Xi$ and $Z\Xi$, in the triangle. But the slightly too large (assumed) value for the side $E\Xi$, and the slightly too small (assumed) value for the other side $Z\Xi$, led Hipparchus to an expression somewhat too small for the longitude of the apogee of the sun, as determined from his own data. He judged that longitude, ΞZH , to be only $65^\circ 30'$; because he found that

$$\begin{aligned} Z\Xi : EZ &= 62 : 142\frac{1}{2} = \frac{24}{60} + \frac{53}{60^2} = \frac{1}{2} \left(\frac{49}{60} + \frac{46}{60^2} \right) \\ &= \frac{1}{2} \text{ chord } 49^\circ 0' = \sin 24^\circ 30'; \end{aligned}$$

and therefore judged the apogee to *precede* the summer solstice by 24 degrees and a-half.

16. The more accurate values for the sides about the right angle, which may be taken out (as above) from the Table of Chords in the *Almagest*, would have given, however,

$$216000 . E\Xi = 216000 \sin 2^\circ 10' = 8166;$$

$$216000 . Z\Xi = 216000 \sin 59' = 3707;$$

$$\therefore 216000 . EZ = \sqrt{8166^2 + 3707^2} = 8968, \text{ nearly};$$

sine of greatest equation of centre

$$= \frac{8968}{216000} = \frac{2}{60} + \frac{29}{60^2} + \frac{28}{60^3};$$

chord of same angle

$$= \frac{4}{60} + \frac{58}{60^2} + \frac{56}{60^3} = \text{nearly } \frac{4}{60} + \frac{59}{60^2} = \text{chord } 4^\circ 46',$$

and greatest equation of centre = nearly $2^\circ 23'$, as before ;

$$\text{but } 2(Z\Xi : EZ) = \frac{2 \times 3707}{8968} = \frac{49}{60} + \frac{36}{60^2} + \frac{11}{60^3} = \text{chord } 48^\circ 50',$$

nearly, by the Table in the *Almagest*; so that (with the supposed data) the apogee *preceded* the solstice of summer (that is, had *less* longitude) by only about $24^\circ 25'$, instead of $24^\circ 30'$; or the longitude of the apogee ought to have been inferred to be, not $65^\circ 30'$, but $65^\circ 35'$. Hipparchus, however, was probably well aware that it was idle, astronomically, to insist on an accuracy of *minutes*, in a result of calculation from observed data, which might easily permit a final error of *degrees*.

17. Our modern tables of logarithmic sines and tangents give easily the same *greatest equation*, $2^\circ 23'$, answering to the same approximate *excentricity*, $\frac{1}{14}$; and also the same (corrected) *longitude of the apogee*, $65^\circ 35'$, as above. Let $e = \sin \epsilon$ = excentricity = distance EZ of centres, divided by the radius ZΘ of the excentric; let ω = longitude of apogee, = AEH = $\Xi ZE = 90^\circ - ZE\Xi$; and, finally, let $90^\circ + \iota$ = ΘK = mean motion in spring quarter, and $90^\circ + \iota' = KA$ = mean motion of the sun in the summer quarter of the year: these latter arcs being computed from the observed number of days elapsed, with the help of the known mean daily motion, derived from the length of the year. Then the equations for this *case* of the 'Problem of Hipparchus' are simply these two:—

$$e \sin \omega = \sin \frac{\iota + \iota'}{2}; \quad e \cos \omega = \sin \frac{\iota - \iota'}{2};$$

giving, of course, $\tan \omega = \sin \frac{\iota + \iota'}{2} : \sin \frac{\iota - \iota'}{2}$.

Hipparchus assumed $\iota = 3^\circ 9'$; $\iota' = 1^\circ 11'$; whence

$$\frac{\iota + \iota'}{2} = 2^\circ 10'; \quad \frac{\iota - \iota'}{2} = 59';$$

$$\tan \omega = \frac{\sin 2^\circ 10'}{\sin 59'} = \tan 65^\circ 35';$$

$$e = \sin \epsilon = \frac{\sin 2^\circ 10'}{\sin 65^\circ 35'} = \frac{\sin 59'}{\cos 65^\circ 35'} = \frac{1}{24};$$

$\epsilon = 2^\circ 23'$: all as before.

$$\log \sin 2^\circ 10' = 8.57757 - 10;$$

$$\log \sin 59' = 8.23456 - 10;$$

$$\log \tan 65^\circ 35' = 10.34301 - 10;$$

taking out this angle to the nearest minute.

$$\log \sin 2^\circ 10' = 8.57757 - 10;$$

$$\log \sin 65^\circ 35' = 9.95931 - 10;$$

$$8.61826 - 10$$

$$(\text{Mean}) \log \sin (\epsilon = 2^\circ 23') \dots 8.61824 - 10.$$

$$\log \sin 59' = 8.23456 - 10;$$

$$\log \cos 65^\circ 35' = 9.61634 - 10;$$

$$8.61822 - 10$$

$$(\text{Compt.}) e^{-1} = 24.086 \dots 1.38176.$$

§ III.—*On the Problem of Hipparchus.*

18. The Problem, which was resolved two thousand years ago by Hipparchus, and which is at this day known by his name, may be thus stated :—

‘Given, in degrees, &c., the angles which two successive arcs, AB , BC , of a given circle ABC , subtend at an excentric point D , as well as at the centre E of the circle, directions of rotation being included : to find the position of the excentric point’.

More fully, if we write

$$ADB = \theta, BDC = \theta', AEB = \iota + \theta, BEC = \iota' + \theta',$$

$$DBE = \kappa, EDB = \nu, ED : DB = e,$$

the four angles θ , θ' , ι , ι' are given, with their respective algebraic signs ; and the two angles κ , ν , and the ratio e , are sought. In the astronomical applications, if we retain Hipparchus's *own* hypothesis of the *excentric*, θ , θ' are the two observed or geocentric motions in longitude, in two successive intervals of time, diminished (for the moon) by the computed progressions of the apogee, in order to render the two extreme observations (at A and C) comparable with the middle observation (at B), by allowing for the supposed progressive motion of the excentric ; ι , ι' , are the computed mean motions in longitude, minus the observed motions in longitude ; whence also $\iota + \theta$, $\iota' + \theta'$, are equal to the computed mean motions in anomaly, since these are the mean motions in longitude, minus the progressions of the apogee, in the intervals between the three observations (from first to second, and from second to third) ; thus the four angles θ , θ' , and ι , ι' , with their algebraic signs, are known, *without trigonometry*, from observation and arithmetic : and as regards the three

sought quantities, κ , ν , e , the first, namely, κ , is the correction for excentricity (or equation of the centre), at the time of the middle observation, to be algebraically added to the observed longitude, or to the angle. $\lambda = \Upsilon DB$, in order to obtain the *mean longitude*, $\kappa + \lambda = \Upsilon' EB$ (where Υ' may be confounded with Υ), the second sought angle, ν , is the apparent or *geocentric anomaly*, EDB or FDB , at the time of the same middle observation; so that

$\lambda - \nu = \omega = \Upsilon DF = \Upsilon' EF$ = longitude of apogee at that time; also

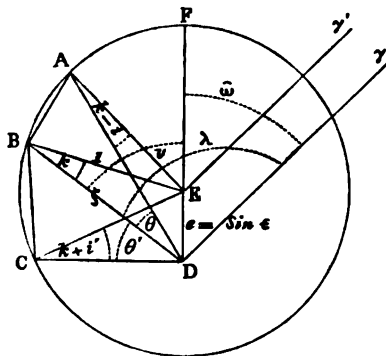
$\kappa + \nu = FEB$ = *mean anomaly* of the body at the middle time;

so that if m denote the mean daily motion in anomaly, and t the middle time, expressed in days, and counted from some fixed era, $t - \frac{\kappa + \nu}{m}$ is the date of the *apogean passage*; finally, e may be called the *numerical excentricity* of the orbit; and in Hipparchus's *own* hypothesis (though *not* in Ptolemy's *modification* of it, by *epicycles*) this excentricity was *less than unity* (the earth being *interior* to the excentric, although *exterior* to the epicycle), so that we may write (as in former articles) $e = \sin \epsilon$, where ϵ = greatest equation of the centre.

19. It is evident that $EDA = \nu - \theta$, and $EDC = \nu + \theta'$; and it is not difficult to prove that $DAE = \kappa - \iota$, $DCE = \kappa + \iota'$; in fact, it is clear that ι , ι' , as being the excesses of the mean over the observed motions in longitude, must be the (algebraical) increments of the correction (κ) for excentricity (applied as above), in the intervals between the three observations. Since then we had also $EDB = \nu$, $DBE = \kappa$, and $DE = e = \sin \epsilon$, if $EA = EB = EC = 1$, the three equations of the Problem are as follows:—

$$(I). \quad \begin{cases} \sin(\kappa - \iota) = \sin \epsilon \sin(\nu - \theta); & (1) \\ \sin \kappa = \sin \epsilon \sin \nu; & (2) \\ \sin(\kappa + \iota') = \sin \epsilon \sin(\nu + \theta'); & (3) \end{cases}$$

which are now to be resolved by trigonometry, so as to deduce the 3 angles κ, ν, ϵ , from the 4 angles $\theta, \theta', \iota, \iota'$.



And to render the question still more definite, it is permitted to assume that ϵ is positive and acute, and that κ lies between the limits $\pm \epsilon$.

20. In the *solar example* of Hipparchus, $\theta = \theta' = 90^\circ$; also $\lambda = 90^\circ$, $\omega = 90^\circ - \nu$; $\sin(\iota - \kappa) = \sin(\iota' + \kappa) = \sin \epsilon$ $\cos \nu = \sin \epsilon \sin \omega$; $\kappa = \frac{\iota - \iota'}{2}$; and the *general equations* (I.) take (as in Art. 17) the simplified forms,

$$\sin \epsilon \sin \omega = \sin \frac{\iota + \iota'}{2}, \quad \sin \epsilon \cos \omega = \sin \frac{\iota - \iota'}{2},$$

giving $\omega = 65^\circ 35'$, $\epsilon = 2^\circ 23'$, as before, if $\iota = 3^\circ 9'$, $\iota' = 1^\circ 11'$. But, of course, the *general solution* cannot be expected to be so simple.

21. In general, the identity,

$$\sin \theta' \sin(\nu - \theta) + \sin \theta \sin(\nu + \theta') = \sin(\theta + \theta') \sin \nu, \quad (4)$$

makes it easy to eliminate ν and ϵ between the three equations (I.), and gives,

$$\sin \theta' \sin(\kappa - \iota) + \sin \theta \sin(\kappa + \iota') = \sin(\theta + \theta'), \quad \sin \kappa, \dots \quad (5)$$

whence

$$D \cdot \cot \kappa = \sin \theta' \cos \iota + \sin \theta \cos \iota' - \sin (\theta + \theta'), \dots \quad (6)$$

if

$$D = \sin \theta' \sin \iota - \sin \theta \sin \iota', \dots \quad (7)$$

and this result, though not in the received and technical sense, *adapted to logarithms*, I have found not ill-suited to calculations with the usual logarithmic tables. We have also,

$$D \cdot \tan (\nu + 90^\circ) = \cos \theta' \sin \iota + \cos \theta \sin \iota' - \sin (\iota + \iota'), \dots \quad (8)$$

with the same denominator, D ; but when κ has once been computed, by the foregoing or by a better method, to be presently explained, we may more conveniently deduce ν from it, by any one of the three following formulæ, which follow easily from the original system (I.) :—

$$(II.) \begin{cases} \tan \left(\nu - \frac{\theta}{2} \right) = \tan \frac{\theta}{2} \cot \frac{\iota}{2} \tan \left(\kappa - \frac{\iota}{2} \right), \dots & (9) \\ \tan \left(\nu + \frac{\theta'}{2} \right) = \tan \frac{\theta'}{2} \cot \frac{\iota'}{2} \tan \left(\kappa + \frac{\iota'}{2} \right), \dots & (10) \\ \tan \left(\nu + \frac{\theta' - \theta}{2} \right) = \tan \frac{\theta' + \theta}{2} \cot \frac{\iota' + \iota}{2} \tan \left(\kappa + \frac{\iota' - \iota}{2} \right), \dots & (11) \end{cases}$$

and may serve as verifications of each other. With tables of *natural sines*, the angle κ might be easily computed from the formula, derived from the equations (6) and (7),

$$\cot \kappa = \frac{\sin (\theta' - \iota) + \sin (\theta' + \iota) + \sin (\theta + \iota') + \sin (\theta - \iota') - 2 \sin (\theta + \theta')}{\cos (\theta' - \iota) - \cos (\theta' + \iota) + \cos (\theta + \iota') - \cos (\theta - \iota')} \quad (12)$$

And there would be an analogous expression for $\tan (\nu + 90^\circ)$. When κ and ν have been found, the original equations give three distinct expressions for $\sin \epsilon$, which may be used as checks on each other. If we dispense with all

such verifications, and have no natural sines at hand, the system (6 and 7) requires *six openings* of a table of logarithmic sines ($\sin \iota$ and $\cos \iota$ being taken out at one opening, and $\sin \iota'$, $\cos \iota'$ at another); it requires also 7 openings, of a table of logarithms of numbers, or (in all) 13 openings of tables, in order to compute the angle κ : after which 4 openings will give ν , by (9); and then 3 more openings will enable us to compute ϵ by (2). Instead of these 20 openings of logarithmic tables, Delambre has supplied a method which requires essentially only 17 different logarithms; but his method appears to me to be much embarrassed by *constructions*, which render it difficult to adapt the process to new varieties of the *figure*, without recommencing the reasonings. I shall, therefore, mention here a second method of my own, in which *only 8 logarithms* are required for the calculation of κ from the equation (5), and therefore *only 15 logarithms* in all; unless (as will always be prudent) we choose to employ formulæ of verification, which my method also furnishes. No reference whatever to a *figure* need be made, if once the algebraical *signs* of the given angles θ , θ' , ι , ι' have been determined, as already explained.

22. Writing the equation (5) under the form,

$$\sin \theta' \{ \sin \kappa \cos \theta + \sin (\iota - \kappa) \} = \sin \theta \{ \sin (\iota' + \kappa) - \sin \kappa \cos \theta' \}, \quad (13)$$

and adding, on both sides, $\cos \kappa \sin \theta \sin \theta'$, we find

$$\sin \theta' \{ \sin (\theta + \kappa) + \sin (\iota - \kappa) \} = \sin \theta \{ \sin (\iota' + \kappa) + \sin (\theta' - \kappa) \}, \quad (14)$$

that is,
$$\sin \theta' \sin \frac{\theta + \iota}{2} \cos \left(\kappa + \frac{\theta - \iota}{2} \right) = \sin \theta \sin \frac{\theta' + \iota'}{2} \cos \left(\kappa - \frac{\theta' - \iota'}{2} \right). \quad (15)$$

Hence,

$$(III.) \left\{ \begin{array}{l} \tan \left(\kappa + \frac{\theta - \iota - \theta' + \iota'}{4} \right) = \tan (\xi - 45^\circ) \cot \frac{\theta - \iota - \theta' - \iota'}{4}, \quad (16) \\ \text{if} \quad \tan \theta = \frac{\sin \theta' \sin \frac{\theta + \iota}{2}}{\sin \theta \sin \frac{\theta' + \iota'}{2}}; \quad (17) \end{array} \right.$$

and we see that *this* system (III.) requires only 8 different logarithms, for the calculation of κ . Any one of the 3 equations (II.) will then give ν , by 4 other logarithms; and all the 3 equations of that system may be used as checks on each other. And, finally, any one of the 3 original equations (I.) will give ϵ , by 3 logarithms; only 15 *logarithms* being thus essentially required, in this Second Method of mine. If, however, for any reason, we wish to calculate, though not really required for the astronomical purpose of Hipparchus, the *distance*, $\rho = DB$, *from the earth to the body observed*, at the middle time, it is easily found that we may do so by either of the two following formulæ:—

$$(IV.) \left\{ \begin{array}{l} DB = \rho = \frac{2 \sin \frac{\theta + \iota}{2}}{\sin \theta} \cos \left(\kappa + \frac{\theta - \iota}{2} \right); \quad (18) \\ \text{or, } \rho = \frac{2 \sin \frac{\theta' + \iota'}{2}}{\sin \theta'} \cos \left(\kappa - \frac{\theta' - \iota'}{2} \right); \quad (19) \end{array} \right.$$

and thus shall introduce 2 new logarithms, raising the total to Delambre's number of 17. In fact, it will be found that

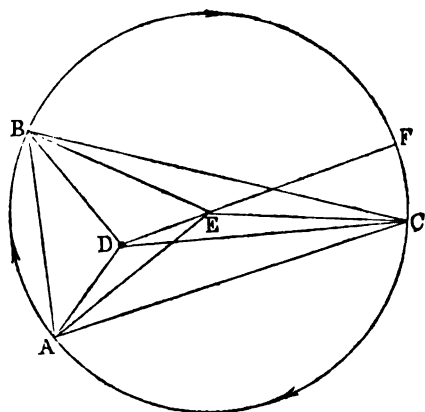
$$\angle BAD = \frac{\pi}{2} - \frac{\theta + \iota}{2} - (\kappa - \iota) = \angle BAE - \angle DAE, \quad (20)$$

$$\text{and } \angle DCB = \frac{\pi}{2} - \frac{\theta' + \iota'}{2} + (\kappa + \iota') = \angle ECB + \angle DCE; \quad (21)$$

while the arcs AB , BC , of the excentric are $\theta + \iota$, and $\theta' + \iota'$, respectively.

NOTES AND EXAMPLES CONNECTED WITH THE PROBLEM
OF HIPPARCHUS.

In the original Problem of Hipparchus, the points here represented by A , B , C were three positions of the sun or moon, in the fixed or moveable excentric but circular orbit of that body, reduced to one common date, by allowing when necessary for the progression of the apogee; D was the fixed centre of the earth, and E was the centre of



the excentric circle, supposed to be fixed (in longitude) for the sun, but to advance uniformly in longitude at a mean daily rate of about $6' 41''$ for the moon; while F (in the present figure) denotes what was supposed to be the fixed or revolving apogean point of the circle. The two angles AEB , BEC , were known by computation from the two observed intervals of time between three observations of longitude of the body (equinoxes and solstices were selected for the sun, eclipses for the moon), combined with the known (or supposed) mean daily motion in anomaly ($59' 8''$

for the sun, $13^{\circ} 3' 54''$ for the moon); these angles being conceived by Hipparchus to be described uniformly about the fixed or revolving centre E , in respect of the apogee F , according to the order of the signs, and therefore from right to left as seen as in a northern latitude, whereas the present figure exhibits the contrary rotation.

The two other angles, ADB , BDC , subtended by the same two chords of the excentric circle, not at its own centre, but at the centre of the earth, were the observed motions in geocentric longitude, diminished (in the case of the moon) by the before-mentioned progressions of the apogee, in order to make the observations comparable, by reduction of them to a common date. Thus, the problem which was (really and historically) proposed and solved by Hipparchus was this:—From the four known angles, subtended by the two chords, AB , BC , of the (reduced) excentric, at the centre E of that circle, and at the centre D of the earth (directions of rotation being included), to find the position of D , with respect to the excentric. Or more fully, to find the *angles* of the triangle BDE , at the time of the middle observation; and also the *ratio*, $ED : EB$, of the distance between the centres of the earth and the excentric, to the radius of that excentric circle: for Hipparchus had no particular motive for investigating the *other* ratio, $DB : EB$, of sides of that triangle, since he had no mode of observing the angular diameters of sun or moon, and was but rudely acquainted with their parallaxes. Ptolemy's discovery of the Lunar Evection gave him a motive and an excuse for substituting, in the stead of Hipparchus's Hypothesis of the *Excentric*, another hypothesis of the *Epicycle*; but of this I need not speak at present, because Ptolemy himself took pains to prove that, *mathematically* considered, the *one* view was equivalent to the *other* (nor does he seem to have attached any the slightest physical *reality* to either of them); and because,

in fact, the only geometrical modification made by him, in the problem of Hipparchus, consists in his having placed the sought point *D* *outside* an *epicycle*, instead of placing it *inside* an *excentric*.

SIR W. R. HAMILTON.

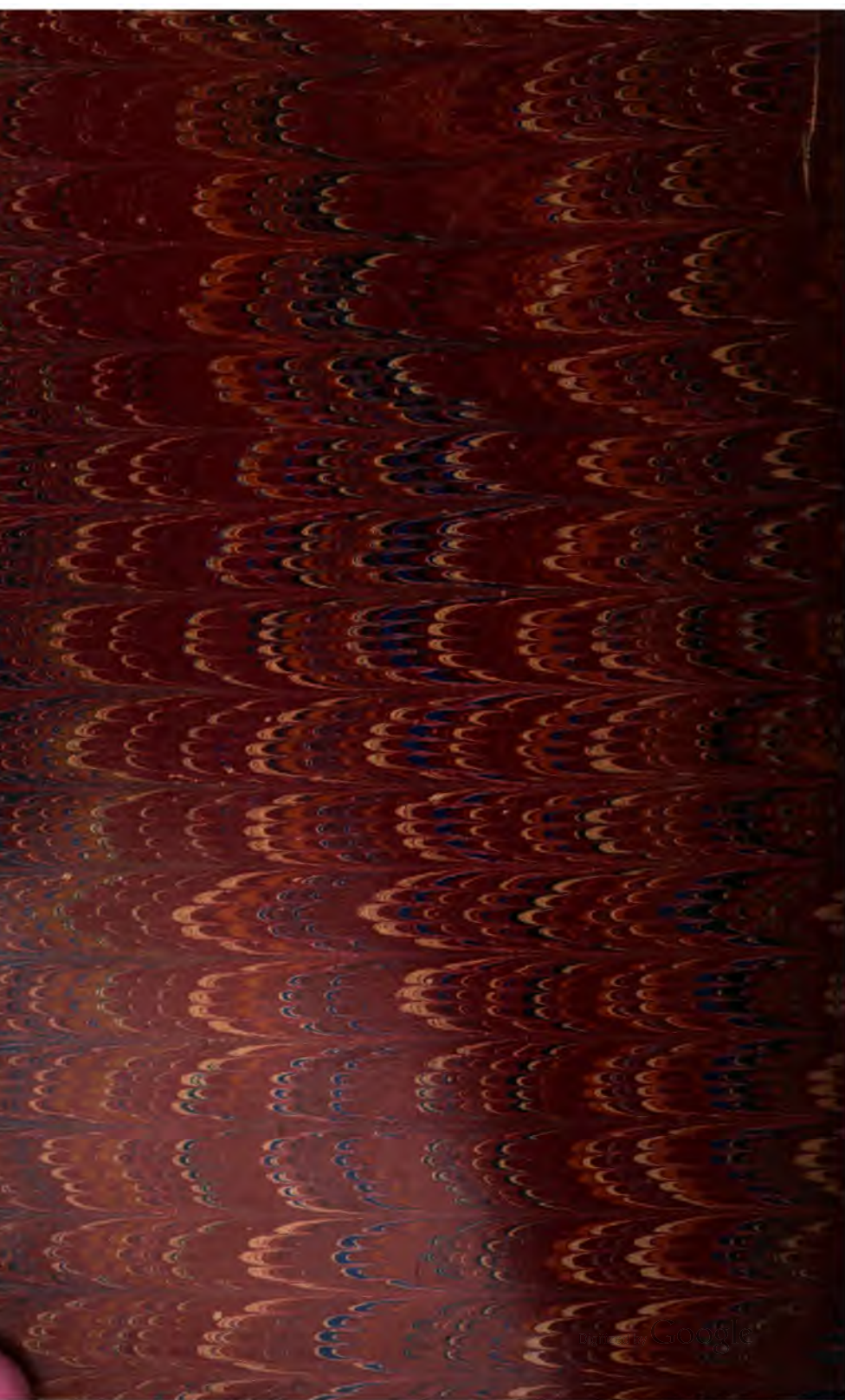
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